

Montana's Comprehensive Fish and Wildlife Conservation Strategy

Montana Fish, Wildlife & Parks 2005

The mission of Montana Fish, Wildlife & Parks is to provide for the stewardship of the fish, wildlife, parks and recreational resources of Montana, while contributing to the quality of life for present and future generations. To carry out its mission, FWP strives to provide and support fiscally responsible programs that conserve, enhance and protect Montana's 1) aquatic ecotypes, habitats, and species, 2) terrestrial ecotypes, habitats, and species, and 3) important cultural and recreational resources.

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Index of Acronyms

AFA	Application for Federal Assistance
BLM	Bureau of Land Management
BOR	Bureau of Outdoor Recreation
CARA	Conservation and Reinvestment Act
CFWCS	Comprehensive Fish and Wildlife Conservation Strategy
CRP	Conservation Reserve Program
CPUE	Catch Per Unit Effort
D-J	Dingell Johnson
DEQ	Department of Environmental Quality
DNRC	Department of Natural Resources
ESA	Endangered Species Act of 1973
FWP	(Montana) Fish, Wildlife & Parks
GAP 50	Geospatial Analysis Program (50 scale)
GYE	Greater Yellowstone Ecotype
HUC	Hydrologic Unit Code
IAFWA	International Association of Fish and Wildlife Agencies
LWCF	Land and Water Conservation Fund
LIP	Land Incentives Program
MDOT	Montana Department of Transportation
MFWP	Montana Fish, Wildlife & Parks
NHP	Natural Heritage Program
NPS	National Parks Service
NRCS	Natural Resource Conservation Service
NWR	National Wildlife Refuge
PIF	Partners in Flight
PILT	Payment in Lieu of Taxes
POD	Point Observation Database
P-R	Pittman-Roberts
RNA	Research Natural Area
SOC	Species of Concern
SWG	State Wildlife Grants
TNC	The Nature Conservancy
TWS	The Wildlife Society
USDA	United State Department of Agriculture
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WCRP	Wildlife Conservation and Restoration Program

Foreword

Montana, like other states, is rich in fish and wildlife species but unfortunately not in the funds needed to address them all successfully. Responding to the need for funding, Congress established the State Wildlife Grants (SWG) program in 2001. The funds support conservation projects for species historically overlooked because money has been short. To ensure that funds are used efficiently and effectively, Congress charged each state to develop a comprehensive assessment of its fish, wildlife, and their associated habitats. Montana Fish, Wildlife & Parks (FWP) committed to developing such an assessment and, after two years of development, created a document that FWP regards as an important evolution in wildlife management.

It might be easiest to view Montana's comprehensive assessment as a statewide fish and wildlife census and as an analysis of the places our fish and wildlife inhabit. The assessment reads almost like a field guide and is a great source of information for anybody interested in Montana's fish and wildlife. This strategy has the potential to bring together people of diverse backgrounds and skills to achieve conservation on a grand scale. It is an opportunity to integrate existing conservation efforts, develop additional programs, and leverage the limited resources available to benefit the most species.

Montana's Comprehensive Fish and Wildlife Conservation Strategy is this generation's opportunity to be part of something as significant as the efforts to pass the Pittman-Robertson and Dingell-Johnson acts, which saw hunters and anglers agreeing to fund conservation efforts through taxes on hunting and fishing equipment. FWP hopes this comprehensive assessment will enable Montana to build on past successes and broaden the agency's ability to fulfill its mission to conserve all species.

Jeff Hagener
Director
Montana Fish, Wildlife & Parks

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Introduction

By Mike Aderhold

For centuries Native Americans observed and hunted Montana's wildlife. Their stories sketched on rocks and passed on by oral tradition constitute Montana's earliest wildlife record.

Montana's scientific wildlife record starts just 200 years ago with the observations of six members of the Lewis & Clark expedition (Lewis, Clark, Ordway, Floyd, Gass and Whitehouse). They followed a western tradition of writing notes on paper. These pioneering naturalists documented the rich variety of wild animals that existed in Montana at the dawn of European settlement.

Heading home in 1806, the Lewis & Clark expedition passed trappers traveling west. These mountain men were soon followed by traders. They were followed by explorers, surveyors, wealthy tourists...pioneering women, prospectors and cowboys... miners, ranchers, missionaries...merchants, railroaders, tradesmen... speculators, entrepreneurs... wolfers, tuskers, and homesteaders. Their tradition was to live off the land as much as possible. The impacts on fish and wildlife were devastating.

In 1912, William Hornaday, then director of the New York Zoological Park, wrote to several Montanans asking about wildlife that had become extinct or was threatened with extinction. In his 1913 book, *Our Vanishing Wildlife* it was noted in the Montana section that many birds were on the verge of extinction. But the only animals that had vanished from the wild were free roaming bison, passenger pigeons and whooping cranes. Threatened animals included blue grouse, trumpeter swans, most waterfowl species, long-billed curlews, white-tailed

ptarmigans, plovers, grizzly bear and moose. Montana had fewer than 3,000 elk, less than 3,000 antelope and very few deer east of the Rockies.

REACTION

The initial reaction of residents of the Montana Territory to their disappearing wildlife heritage included passage of protective legislation, creation of a wildlife agency, instituting revenue generating licenses, organization of an enforcement effort, and the start of a wildlife restoration program.

EARLY LEGISLATION (1864-1893)

The first Montana Territorial Legislature (1864-65) passed a bill requiring "...a rod or pole line and hook...to catch trout in the Territory". In 1876 a law was passed prohibiting fishing with explosives. In 1881 a law was passed prohibiting the dumping of sawdust and mill waste into a stream. Starting in 1883 the popular pastime of collecting bird eggs was prohibited. In 1893 moose and elk hunting seasons were closed statewide.

CREATION OF A MONTANA WILDLIFE AGENCY (1901)

When Montana became the 41st State of the Union on November 8, 1889, county commissioners were empowered to hire one game warden for each county. There was either no money or little concern because no wardens were immediately appointed. By 1900 only four of the then 24 counties hired game wardens. The first board of Fish and Game Commissioners was appointed by Governor Robert A. Smith on March 4, 1895. A State Game Warden, R.A. Wagner, was appointed in July 1898.

The 1901 Legislature, acting on a recommendation of the Fish and Game Commissioners, organized the Montana Fish and Game Department (April 1, 1901). The charter created fish and game districts and authorized the appointment of up to eight "deputies"- one for each district. The new Department received over 1,000 applications for positions that paid \$100 per month including travel expenses.

ENFORCEMENT (1886-1916)

It is impossible to regulate effectively without some degree of enforcement. This was discovered in Yellowstone National Park where despite federal and state laws, market hunting, souvenir collecting and livestock trespass were rampant. Early Park Superintendents and visiting naturalists documented the problem and finally appealed to War Department Secretary W.W. Belknap.

On August 20, 1886, Captain Moses Harris, led M Troop, First United States Cavalry, into Mammoth Hot Springs, Wyoming. He took over the duties of the

civilian superintendent and his soldiers assumed the role of park police. Captain Harris was under orders from General Phil Sheridan to control the poachers, stop the vandalism and protect the buffalo and elk.

Eight years later Congress would pass the Yellowstone Park Protection Act of 1894 giving the Army some authority to arrest violators and confiscate their equipment. The Army would stay in Yellowstone Park for 32 years and become the model for National Park Service rangers and western State Game Wardens.

Initially all of Montana's Fish and Game employees were commissioned law enforcement officers. The Director was initially called the "State Game Warden" and the district employees were called "Deputy Game Wardens". One of the first assignments of new deputies was to go throughout their districts posting the game laws.

FIRST LICENSES (1901-1905)

The 1901 legislature required nonresidents to purchase a \$25 big game license and a \$15 license was required to hunt game birds. The first resident hunting and fishing license was created in 1905. The cost of the license was \$1, at a time when a laborer's wage was \$2 a day. Only one license was required per family. There were 30,220 licenses sold in 1905. Receipts for the year were \$30,593.50 and expenses incurred by the Fish and Game were \$16,788.40. In 1906, receipts totaled \$24,491.13 and expenses were \$17,410.95.

This new system required a support staff. The first year 300 Justices of the Peace were supported to some degree by the license sales and fines for wildlife violations.

LAND PROTECTION AND RESTORATION (1872-1936)

In 1872 Congress set aside 3,300 square miles of land around the headwaters of the Yellowstone River. *"...to provide against the wanton destruction of fish and game... and against their capture or the destruction for the purpose of merchandise..."*. Yellowstone National Park and the enactment of its Protection Act in 1894, were the first field efforts to conserve wildlife habitat in the West.

President Benjamin Harrison started the first government "preserve" in 1892 when he set aside Afognak Island off the coast of Alaska for the protection of terrestrial wildlife, salmon and sea mammals. President Theodore Roosevelt started the national "Refuge" movement in 1903 with Pelican Island NWR off the east coast of Florida. Before leaving office in 1909, Roosevelt created 52 more wildlife refuges on federal land - all by "executive order". In 1908 Congress followed by authorizing federal funds to purchase 12,800 acres from the Flathead Indians for the first part of the National Bison Range.

Between 1911 and 1936 the State of Montana established 46 “Preserves” starting with the Snow Creek, Pryor Mountain, and Gallatin Preserves in 1911 and the Sun River Preserve in 1913. Between 1913 and 1925 state refuges and preserves were established in 24 states.

The original “preserve” concept was to protect relic wildlife populations from hunting and human harassment. As these protected populations increased they naturally spread to adjacent areas and some resident animals were trapped and relocated to suitable habitat. In 1910, 25 elk from the Northern Yellowstone Park winter range were relocated to Fleecer Mountain. This was the first Fish and Game relocation of a big game species. Butte and Anaconda hunters and anglers paid \$5/elk to cover the transportation.

In 1907 the Montana Legislature created a \$1 resident fishing license. Some of this money was used the next year to open the first state fish hatchery in Anaconda. This hatchery was initially used to raise cutthroat trout to enhance populations throughout their Montana range.

Wardens and Forest Service personnel started surveying elk along the Rocky Mountain Front in 1903.

PITTMAN-ROBERTSON ACT (1937)

In 1936, the first North American Wildlife Conference brought together leaders of the most prominent conservation organizations and representatives from more than 20 agencies concerned about the nation’s wildlife resources. The “proceedings” of this meeting, now a collector’s item, brought together more information on the status of North American wildlife and the problems facing wildlife conservation, than had ever been published in one volume. Out of this meeting came a commitment to develop a “national wildlife program”.

In 1937, a Senate Special Committee on the Conservation of Wildlife Resources and a similar committee in the House introduced a bill earmarking Depression Era excise taxes on sporting arms and ammunition to state wildlife agencies for conservation easements, development, and research. The Federal Aid in Wildlife Restoration Act, or Pittman/Robertson Act (named for the two committee chairmen, Rep. A. Willis Robertson, Virginia, and Sen. Key Pittman, Nevada), became law September 2, 1937.

This law created a special fund that continues to earn revenue from an 11% federal excise tax on firearms, ammunition, and archery equipment, and a 10% tax on handguns. This fund is administered by the U.S. Fish and Wildlife Service. Most of the revenue is apportioned among the states by a formula based 50%, on the state’s area and 50% on the number of hunting license holders. No state receives less than one-half of 1%, or more than 5%, of the amount annually available. These federal allocations must be matched by state funds, with states

providing at least 25% (for every dollar of federal money, the states must match with 33.33 cents). One of the most farsighted features of the act was a 29 word requirement that each state must prohibit diversion of hunting license revenue to other uses. All 50 states have enacted such laws. The goal was to ensure that every state could sustain a long-term wildlife restoration and management program.

This foundation allowed Montana to buy land for wildlife (1938) and to employ its first wildlife biologists (1940). Since its passage, Montana has received \$125,230,898 dollars in apportionments (through FY04). Most of Montana's 84 Wildlife Management Areas were purchased with these matching funds.

In 1970 amendments to the P-R Act gave Montana an option. Instead of submitting individual projects, it could submit a "comprehensive fish and wildlife resource management plan" covering at least five years. Once approved, projects encompassed by this plan, would be routinely funded.

DINGELL-JOHNSON ACT (1950)

During World War II Congress enacted excise taxes on fishing equipment. After the War, Rep. John Dingell, Michigan and Sen. Edwin Johnson, Colorado, put together a bill modeled closely after the P-R program using revenues originally derived from the 10 percent federal excise tax on fishing rods, creels, reels, artificial lures, baits and flies. Forty percent of this allocation is based on the state's geographic area and 60 percent on the number of the state's fishing license holders. This law also had a requirement that the state must prohibit the diversion of fishing-license revenues and there was also a requirement for a 1:3, state:federal match. The statute was officially called the Federal Aid in Sport Fish Restoration Act and Montana through FY04 has received \$103,378,741 dollars.

With this new funding the Fish & Game Department (later Fish, Wildlife & Parks) hired regional fisheries biologists and started a number of management projects including native fish management in rivers, the impact of logging on streams, fish problems at irrigation diversions, a study of the habits and habitat of native grayling and, in 1955, the long remembered exotic fish removal above the site of Tiber Dam.

It was also during the 1950s that the seven administrative regions were established, with regional offices set up in Kalispell, Missoula, Bozeman, Great Falls, Billings, Glasgow and Miles City.

LAND AND WATER CONSERVATION FUND (1965)

In 1963, in response to increasing demands for outdoor recreation, Congress created the Bureau of Outdoor Recreation (BOR) in the Department of Interior. Two years later, in 1965, Congress established the Land and Water

Conservation Fund using monies from the disposal of federal surplus property, certain user fees and some of the federal royalties from offshore (outer continental shelf) oil and gas production. Money from this fund is appropriated by Congress and the amount varies. It has been as high as \$900 million a year nationwide.

The broad purpose of LWCF is to "...provide a diversity of outdoor recreation resources which would allow individual active participation in a variety of outdoor pastimes...".

Up to 60% of the appropriation may be used to cost-share, on a 50:50 matching bases, certain activities carried out by the states, including "...planning, acquisition and development of needed land and water areas...". Responsibility for the program was transferred to the National Park Service in 1981.

Over the years this funding has been erratic. In 1965 the funding was \$300 million; \$600 million in 1978; \$900 million from 1980 through 1989. During the 1980s dozens of Montana communities funded swimming pools and tennis courts and FWP's Parks Division purchased Wildhorse Island and parts of Giant Springs Heritage State Park.

During the 1990s the appropriations were greatly reduced and the state/local part of the LWCF dropped to zero between 1995 and 1999. The Bureau of Land Management (BLM), U.S. Forest Service (USFS) and U.S. Fish & Wildlife Service (USFWS) all receive LWCF money which has been used to purchase in-holdings, wetlands and some easements.

ENDANGERED SPECIES ACTS (1966, 1969, 1973)

During the 1960s concern grew about the status and conservation of our rarest plants and animals. There was prolonged debate about the role of government for species threatened by human activities. The first result was the Endangered Species Preservation Act of 1966. That law directed the heads of all federal agencies in the Departments of Interior, Agriculture and Defense to protect native wildlife declared "endangered". It also provided funds to acquire habitat for these animals. It required the Secretary of the Interior to identify species in jeopardy.

In 1969, Congress passed the Endangered Species Conservation Act. It expanded the definition of "fish and wildlife" to include reptiles, amphibians, mollusks and crustaceans. It expanded the listing to include animals classified as "threatened with extinction" and it made commercial traffic of "endangered" and "threatened" species illegal.

A few years later Congress enhanced the 1969 Act still more to create the Endangered Species Act of 1973 (ESA). With a few changes this is the statute we use today. This law formalized the listing procedure and required the

development of “recovery plans”. It increased criminal penalties, added funds for habitat acquisition and put state “threatened” and “endangered” species under the clear authority and legal jurisdiction of the federal government.

There was also movement at the state level. In 1972, the International Association of Fish and Wildlife Agencies (IAFWA) and The Wildlife Society (TWS) developed a model state nongame and endangered species law. The 1973 Montana Legislature adopted this law on July 1, 1973. It granted Fish, Wildlife & Parks the authority to conserve resident “endangered” and “threatened” wildlife and to conduct nongame and endangered species research, acquire habitat for their use and to develop management programs for these species.

Presently, Montana has 14 species listed as either federally “Threatened” or “Endangered” – 4 birds, 4 mammals, 3 fish and 3 plants. “Threatened” (9 species) include Bald Eagle, Piping Plover, Grizzly Bear, Gray Wolf, Canada Lynx, Bull Trout, Water Howellia, Spalding Catchfly, Ute Ladies’- tresses. Endangered (5 species) include Whooping Crane, Least Tern, Black-footed Ferret, Pallid Sturgeon, White Sturgeon. Nationally there are now 276 Threatened species (147 plants) and 987 Endangered species (599 plants).

FORSYTHE-CHAFEE ACT (1980)

In 1980 Congress passed the Fish and Wildlife Conservation Act that is also referred to as the Nongame Act or Forsythe-Chafee Act (John Chafee, Rhode Island and Edwin Forsythe, New Jersey). This was meant to to promote the conservation of nongame fish and wildlife that receive relatively little (12-13%, 1985, FWS est.) assistance under the Pittman-Robertson and Dingell Johnson statutes. The Forsythe-Chafee Act authorizes federal technical and financial assistance to the states, generally on a 75%-25% state basis, for the development of plans, programs and projects benefiting nongame animals. “Nongame” is defined as those species “not ordinarily taken for sport” and which are not listed as “endangered” or “threatened” under the Endangered Species Act.

The Forsythe-Chafee Act was to be financed by general revenue appropriated annually by Congress. The statute authorized appropriations up to \$5 million for fiscal years 1982-1985 but neither the Reagan Administration nor Congress ever appropriated any money.

The U.S. Fish & Wildlife Service studied 25 potential funding methods including general appropriations, various fees and different excise taxes. In 1986 Congress held a hearing on nongame legislation and the financing study, but because of the deficits during the Reagan and the first Bush Administrations, this nongame proposal stalled.

MITCHELL ADMENDMENT (1988)

Some dramatic declines in shore birds and neotropical migrants were documented during the 1980s. Several bird, conservation organizations made this concern a cause and Congress responded by adjusting the U.S. Fish & Wildlife Service's budget expressly for bird monitoring. The new Senate Majority Leader George Mitchell pointed out that the USFWS, under the Migratory Bird Act of 1918 and the Fish & Wildlife Conservation Act of 1980, had responsibility to monitor all migrating birds not just waterfowl and raptors. The USFWS needed to identify management actions before any particular species becomes listed as Federally threatened or endangered.

This was a strong message from Congress that it was time for the USFWS and other wildlife agencies to reexamine their programs and establish new priorities for all wildlife species. The National The Audubon Society dedicated 31 intermountain/foothill grassland to this specific issue in its 1989/1990 Wildlife Report.

PARTNERS IN FLIGHT (1990)

Partners In Flight (PIF) is a cooperative effort involving federal, state and local government agencies, philanthropic foundations, professional organizations, conservation groups and the academic community. It was launched in 1990 to promote the conservation of birds not covered by existing conservation activities. Its initial focus was on neotropical migrants – species breeding in North America and wintering in Central and South America.

The goal of Partners In Flight is to focus resources on improving monitoring, inventory, research, management and education programs involving birds and their habitats. This group and the North American Bird Conservation Initiative, Bird Conservation International, the National The Audubon Society Society, and others kept the pressure on for nongame funding.

TEAMING WITH WILDLIFE INITIATIVE (1995)

The Internation Association of Fish and Wildlife Agencies (IAFWA) was founded in 1902 and today it includes the leaders of wildlife agencies throughout the U.S., Canada and several Central American countries. In 1995 this group took on the challenge of finding money for a comprehensive wildlife management program. Traditionally western state wildlife programs have been almost exclusively supported by hunters and anglers.

IAFWA recruited a "team" that included the American Fisheries Society, the Izaak Walton League, the National Wildlife Federation, the National The Audubon Society Society, The Nature Conservancy, The Wildlife Society, the Wildlife Management Institute and others. They developed an idea to establish a federal

tax on a variety of outdoor supplies including backpacks, sleeping bags, tents, canoes, binoculars, spotting scopes, photographic equipment, bird seed, feeders, etc. The money would be allocated to states to fund programs benefiting nongame wildlife.

This movement eventually attracted over 3,000 supporting groups and in 1998 the team introduced the initial version of CARA (Conservation and Reinvestment Act).

MAGNUSON-STEVENSON (1996)

During the 1980s and early 1990s some coastal fish stocks diminished to the point where their survival was questioned. Senators Warren Magnuson (Washington) and Ted Stevens (Alaska) led the discussion about coastal species and the impact on the economy of coastal cities and towns. In the hearing for the Fishery Conservation and Management Act much was said about the continuing loss of marine, estuarine and other aquatic habitats. The law highlighted the need for a national program to address conservation and management of the fishery resources throughout the United States. This, along with mounting concern about bird species, added more impetus to the push for a broad-based fish and wildlife conservation program.

CONSERVATION AND REINVESTMENT ACT (1997)(CARA) FIRST ITERATION

The CARA concept came from two places. The first was the Teaming With Wildlife coalition which initially settled on the “tried & successful” excise tax idea by which hunters and anglers supported the P-R and D-J programs. The challenge was how to get the millions of recreationists who do not hunt or fish to pony up a share of the money needed to research, monitor and manage the majority of wildlife species not classified as “game”.

The “teaming” concept was a creative partnership of recreation groups, equipment manufacturers, retailers, state and local politicians, land management agencies, wildlife agencies and others. The number of team members eventually surpassed 3,500. Each group wanted consideration for their special interest. The bill grew weekly and eventually had 8 Titles or Sections dealing with a.) coastal conservation; b.) land and water funding – city parks and recreation areas; c.) nongame funding; d.) state park programs; e.) historic preservation initiatives; f.) federal lands and Indian lands; g.) conservation easement and species recovery programs and h.) federal payments in lieu of taxes (PILT payments).

This huge bill got a trial run in 1997. No one was prepared to embrace the whole thing. Unlike the gun manufacturers in 1937, many recreation equipment manufacturers and dealers were reluctant to advocate higher taxes for their

customers and higher cost for their products. Some consumers broke ranks with their interest groups and expressed opposition. No Senator or Representative was willing to sponsor a bill with so many new taxes and so much new spending.

*CONSERVATION AND REINVESTMENT ACT (1998) (CARA) SECOND
ITERATION*

Rather than collect money from people who buy outdoor products some suggested using the federal royalties and taxes from offshore oil and gas leasing and production. That idea had been around since the Land and Water Conservation Fund was created in 1965. The revenue, which is over \$4 billion a year, generally goes directly to the Treasury. A slice of it had been pared out for LWCF but the bulk of this money had been used to balance the budget since the Carter Administration (1977-1981). The Clinton Administration was enjoying prosperity and there was a budget surplus so, in a bipartisan move, the proposed funding source for CARA funding source was switched to off shore oil and gas royalties. CARA would guarantee \$3 billion annually from the offshore drilling account for a 15 year period for all the programs in the original bill.

Scores of lawmakers came on board at the prospect of guaranteed funding for their states. Hundreds of grass root and national conservation groups continued to push the CARA idea in hope of winning earmarked money for their pet projects. President Clinton swore to make passage of CARA a priority in his final 2000 budget negotiations. All 50 governors supported CARA.

This idea started, not with the Teaming with Wildlife crew, but with a comparatively limited four-year-old proposal to use royalties from offshore oil and gas drilling to mitigate the damages caused by those activities. The initial draft plan would have created a revenue-sharing and coastal conservation fund for coastal states and the conservation of coastal areas.

The Conservation and Reinvestment Act flew high the summer of 2000. It passed the House with a 315 to 102 vote and had 66 sponsors in the Senate. The Senate Energy and Natural Resources Subcommittee voted 13-7 to report the historic legislation to the full Senate.

As the Clinton administration moved to a close, CARA encountered resistance. Some viewed the guaranteed, mandatory \$45 billion, 15-year stream of funding as an "entitlement" that circumvented the appropriations process. Western legislators did not like the LWCF Title and the potential to shift more land from the private to the public sector. Some Senators balked at the magnitude of the spending and brought up concerns about Social Security and Medicare. Still others brought up concerns about the primary maintenance backlog in National Parks and National Wildlife Refuges and suggested dealing with those problems first before acquiring new land. Finally some were angry at the administration's move to create a number of new National Monuments.

In the fall, just before the November 2000 presidential election the White House backed off the CARA proposal and worked out a compromise with the House Interior Appropriations Committee. The \$3 billion a year, 15-year, guaranteed \$45 billion package was reduced to a 6 year, \$12 billion total discretionary fund. This was called CARA Lite. President Clinton signed this bill (HR 4578) on October 11, 2000.

STATE WILDLIFE GRANTS (2001)

In 2001, during the first year of the George W. Bush administration, Congress created the State Wildlife Grant program (SWG). The State Wildlife Grant funding was aimed at providing help to the states to develop a broad-based, comprehensive wildlife program that addressed all vertebrate wildlife species. The hope was that implementation of such a program could avoid the expense and problems that come with recovering threatened and endangered species.

State Wildlife Grant monies are appropriated annually. So far Montana has received almost \$4.5 million: (\$1.3 million, 2002; \$1.0 million, 2003; \$1.08 million, 2004; and \$1.09 million, 2005) plus \$852,710 from a one-time 2001 transition program called the Wildlife Conservation and Restoration Program (WCRP).

In Montana, some of the State Wildlife Grant funds have been used to survey prairie fish, restore native Arctic grayling and westslope cutthroat trout, study sauger genetics and sauger movements in the Yellowstone River, investigate the status of native burbot, support management of the grizzly bear and the gray wolf, conserve black-tailed prairie dogs, and to conduct a statewide inventory of small mammals.

To receive future funding every state must develop a Comprehensive Fish and Wildlife Conservation Strategy by October 1, 2005. These strategies will help define a more integrated approach to the stewardship of all wildlife species with additional emphasis on species of concern and habitats at risk. It could shift the focus from single species management and highly specialized individual efforts to a more geographically based, landscape-oriented fish and wildlife conservation effort.

Comprehensive Strategy Goals

This Comprehensive Strategy embraces all vertebrate species known to exist in Montana including both game and nongame species as well as some invertebrate species (freshwater mussels and crayfish). In the early years of fish and wildlife management, the focus was clearly placed on game animals and their related habits. This was, and continues to be, a result of almost all of the agency's funding being provided by hunters and anglers. Although FWP has no intention of reducing the attention focused on important game species, it is apparent that effective conservation actions directed to particular community types will benefit a variety of game and nongame species. As a result, FWP believes that with this new funding mechanism and conservation strategy in place, managing fish and wildlife more comprehensively is a natural progression in the effective conservation of the remarkable fish and wildlife resources of Montana.

Although game species are included in the Strategy, its priority is to describe those species and their related habitats in greatest conservation need. We interpreted "in greatest conservation need" to mean focus areas, community types and species that are significantly degraded or declining, federally listed, or where important distribution and occurrence information to assess the status of individuals and/or groups of species is lacking. Because management of game species has been largely successful over the last 100 years, most have populations that are stable or increasing and fewer were identified as in greatest conservation need (49 nongame, 11 game).

The methods and databases developed as part of this planning process are powerful tools that could be used in the future to help integrate other fish and wildlife management priorities as they are established. For this particular iteration of the Strategy, the following goals were developed.

- Identify all of Montana's fish and wildlife and related habitats in greatest need of conservation
- Develop and prioritize management strategies to conserve fish and wildlife and related habitats in greatest need
- Work independently and in partnership to conserve, enhance and protect Montana's diverse fish and wildlife resources, and address each species equitably regardless of classification as game or nongame, rare or "at risk"
- Improve FWP's ability to address present and future funding challenges and opportunities
- Integrate monitoring and management of game and nongame fish and wildlife species

- Meet all 8 requirements of WCRP and SWG

Eight Required Elements

Congress identified the required elements of this Strategy in the WCRP legislation and the USFWS adopted those same elements as a condition of receiving WCRP and SWG funds.

1. Information on the distribution and abundance of species of wildlife, including low and declining populations, as the state management agency deems appropriate, that are indicative of the diversity and health of the State's wildlife.
2. Descriptions of locations and relative condition of key habitats and community types essential to conservation of species identified in (1).
3. Descriptions of problems that may adversely affect species or their habitats identified in (1), and priority research and survey efforts needed to identify factors that may assist in restoration and improved conservation of these species and habitats.
4. Descriptions of conservation actions determined to be necessary to conserve the identified species and habitats and priorities for implementing such actions.
5. Proposed plans for monitoring species identified in (1) and their habitats, for monitoring the effectiveness of the conservation actions proposed in (4), and for adapting these conservation actions to respond appropriately to new information or changing conditions.
6. Descriptions of procedures to review the Comprehensive Strategy at intervals not to exceed ten years.
7. Plans for coordinating, to the extent feasible, the development, implementation, review, and revision of the Strategy with Federal, State, and local agencies and Indian Tribes that manage significant land and water areas within the state or administer programs that significantly affect the conservation of identified species and habitats.
8. Congress has affirmed through WCRP and SWG, and other guidance to us and our partners, that broad public participation is an essential element of developing and implementing these Strategies, the projects that are carried out while these Strategies are developed, and the Species in Greatest Need of Conservation that Congress has indicated such programs and projects are intended to emphasize.

International Association of Fish and Wildlife Agencies Guidelines

In addition to the 8 Congressional requirements, the International Association of Fish and Wildlife Agencies (IAFWA) and the U. S. Fish and Wildlife Service (USFWS) established supplemental guidelines to assist with Strategy development (Appendix A). These guidelines provided recommendations within four areas: 1) planning process and partnerships, 2) focus and scope, 3) format and content, and 4) completion, outcomes, and availability. The FWP CFWCS planning team used all of these guidelines in the creation of this document.

Planning Approach

Technical and Steering Committees

Development of the Strategy was guided by a steering committee and a technical committee. The Technical Committee served in an advisory capacity to the Steering Committee. Steering Committee members guided the planning processes including approach to public and outside agency involvement, allocation of funds (Appendices B, C, and D), approval of methods and results for identifying habitat, species and survey and inventory priorities and internal preparation for implementation of the Strategy.

Steering Committee

Chris Smith	Chief of Staff
Larry Peterman	Chief of Field Operations
Ron Aashiem	Administrator of Conservation and Education
Mike Aderhold	Regional Supervisor
Don Childress	Administrator of Wildlife Division
Chris Hunter	Administrator of Fisheries Division

- Roles and Responsibilities: Provide policy-level direction and oversight to development of FWP's Comprehensive Fish and Wildlife Conservation Strategy and use of the SWG funds; approve projects to be funded with SWG; allocate SWG funds and FWP matching funds to support projects.

Technical Committee

Janet Hess-Herbert	Information Management Unit Leader
T.O. Smith	Fish and Wildlife Conservation Planning Coordinator
Adam Brooks	Federal Assistance Coordinator
Rebecca Cooper	Federal Assistance Specialist
Ken McDonald	Fisheries Management Bureau Chief
Tom Palmer	Information Bureau Chief
Jen Pelej	Information Specialist

Brad Schmitz	Regional Fisheries Manager
Jim Williams	Regional Wildlife Manager
Heidi Youmans	Nongame Bureau Chief
Graham Taylor	Regional Wildlife Manager

- Roles and Responsibilities: Assist in the development of FWP's Comprehensive Fish and Wildlife Conservation Strategy; identify, evaluate and prioritize potential SWG projects; recommend allocation of SWG funds to Steering Committee; develop Applications for Federal Assistance (AFA, a document required to receive SWG funds) and other required project documentation, including interim and final reports; monitor implementation of projects, including tracking budgets and expenditures.

Exploratory Groups

FWP Staff Exploratory Group

A group of FWP staff was assembled early in the planning process at the request of the Technical and Steering Committees to develop ideas about the most effective way to develop Montana's Strategy that would meet all 8 Congressional requirements (Appendix E).

FWP Law Enforcement Exploratory Group

Enforcement officers were brought together as an exploratory group and they identified the ways that Law Enforcement could help implement the priorities identified by the Montana's Strategy if Congress allowed some of future allocated SWG funding to be used for enforcement activities (Appendix F).

Agency and Non-Governmental Organization Exploratory Group

Before planning began, agencies and organizations that manage significant land and water areas or have significant control over these areas were invited to participate in an advisory group meeting led by Jeff Hagener, FWP Director. The goal of this meeting was to identify what level of involvement each of these groups wanted to have during the development of the Strategy. All of the participants indicated that their respective agencies and organizations were interested in the Strategy and would also like to be informed of progress on the Strategy and would be willing to provide support as needed. Most participants indicated that they would like to have the opportunity to review the Strategy prior to its submission to the USFWS (Appendix G).

Public Involvement

Public involvement is critical to development of a strategy for Montana and will become even more important as FWP moves toward implementation. The first

steps toward gaining public involvement in development of the Strategy were to hold an Advisory Group meeting and conduct a mail back survey. The purpose of the Advisory Group meeting, held in October 2004, was to identify what level of involvement stakeholder organizations wanted to have during the Strategy development process. The survey, on the other hand, was administered by mail to randomly selected Montana residents. The goal was to learn their opinions on the types of comprehensive management that SWG funds promote (results included below). The information obtained was used to aid development of the comprehensive strategy and will help direct its implementation.

In addition to the Advisory Group and survey, other public involvement tools have been used or will be used to involve partner groups, fish and wildlife enthusiasts, landowners, and more. As part of the strategy review process, FWP will hold seven public meetings this summer, one per region, where attendees can learn more about the strategy and provide comments. Print publications, including an executive summary and visual aids will be available at the public meetings. In addition, online news pages have been developed on the FWP website at <http://fwp.state.mt.us>, under "Wild Things." Background information and the draft strategy will be posted in a user-friendly format to facilitate review and comment. Press releases were/will be issued regarding developments in SWG funding, the release of the draft Strategy for review, and its submittal for publication. All press releases are posted online as well.

After publication of the Strategy, extensive statewide outreach will occur. Outreach plans include print publications, educational materials and programs, press releases, online announcements, posters, magazine and television features, video, face-to-face communications, and more. The audiences will include elected officials, landowners, conservation groups, agricultural and industry interests, other government agencies, community leaders, Tribes, educational institutions, fish and wildlife enthusiasts, hunters and anglers, media, etc. Montana's public involvement efforts will also be linked to a national information campaign, led by the International Association of Fish and Wildlife Agencies.

The comprehensive strategy is designed to be collaborative with local communities and partner groups. Efforts will be made to distribute as much information as possible, solicit and incorporate feedback, and develop support and involvement in the implementation of recommended actions.

SWG Survey

FWP conducted a mail survey of Montana residents during late summer, 2004 to learn their opinions about the types of comprehensive management SWG promotes. The goals of the survey were to:

- Better understand what Montanans think about FWP conserving all fish and wildlife species in Montana.
- Provide information that will aid development and future implementation of Montana's Comprehensive Fish and Wildlife Conservation Strategy.

Mail back surveys were administered to 10,500 randomly selected households across Montana, and nearly a 30 percent response rate to the survey was achieved.

Survey Discussion

Overall, the survey results suggest that most Montanans are supportive of FWP taking a broader role when it comes to managing the state's diverse fish and wildlife. A majority of the survey respondents (62%) reported it is important or very important to them that FWP ensure there are healthy populations of nongame animals.

Implementing the Strategy will be the biggest challenge and at this point in time, providing the appropriate level of nonfederal match is the biggest concern. This survey asked two key questions related to funding: (1) Are Montanans supportive of FWP using some monies obtained from hunters and anglers to help match federal SWG funding? and, (2) Are Montanans willing to help pay for the conservation of nongame animals in ways other than by purchasing hunting and/or fishing licenses and equipment?.

Results from this survey revealed that most Montanans are supportive (56%) of FWP using some monies obtained from hunters and anglers to help match federal SWG funding. However, there were a significant number (32%) of respondents who reported this to be unacceptable to them. Furthermore, only about half of the hunter and anglers identified in the survey found this be acceptable to them. These findings suggest that while it is acceptable for FWP to use some hunter and angler license dollars for this purpose, the agency needs to act prudently in doing so and should keep hunters and anglers informed of how their license dollars are being used.

Another question posed by the survey was, what about other potential sources of funding to help match federal SWG funding? A majority of the survey respondents (61%) said they would not be willing to help pay for the conservation of nongame animals in ways other than by purchasing hunting and/or fishing licenses and equipment. From this survey it appears that most Montanans are supportive of FWP taking a broader role when it comes to managing the state's fish and wildlife. Yet, most are unwilling to help directly pay for this in ways other than by purchasing hunting and fishing licenses. The results of this survey have confirmed that securing alternate funding will be a major challenge for implementation of Montana's Comprehensive Fish and Wildlife Conservation

Strategy in the future. Additional research on this topic is recommended if FWP is to successfully take the steps necessary to fully meet the needs of a broader constituency.

The Four Components of Montana's Strategy

Montana's Comprehensive Fish and Wildlife Conservation Strategy is organized into four components. At the broad scale, focus areas in component 1 help guide attention to certain geographical areas of Montana where the fish and wildlife community types (component 2) that are in greatest need of conservation occur. Often, fish and wildlife within a community type face similar conservation concerns. Addressing these concerns using community level conservation allows many species to comprehensively benefit from conservation strategies. However, some species populations have declined so far, or are so specialized that conservation strategies at the broad scale might not be effective. Therefore, the 60 fish and wildlife species in greatest need of conservation have been included in component 3. The conservation strategies of these species should be addressed specifically whether through broad or fine scale actions. Finally, there are many species and groups of species that we do not have available adequate occurrence data for in order to determine their status. Component 4 provides a list of these species and groups of species that are in greatest need of inventory.

Component One: Geographic Focus Areas in the landscape that contain significant fish and wildlife communities (species and their associated habitats) that are identified as being in greatest need of conservation.

This is a strategy to focus resources and efforts toward geographical areas where they can benefit the largest number of species and communities in need of conservation

Component Two: Fish and Wildlife Community Types that are in the greatest need of conservation (7 identified).

This is a high leverage strategy to address the conservation concerns of whole ecological communities or species groupings. Implementing conservation strategies at this level will comprehensively benefit many fish and wildlife species.

Component Three: Fish and Wildlife Species that are in the greatest need of conservation (60 identified).

Species whose needs must be specifically addressed, whether through focus areas, community types or directly or indirectly

Component Four: Species and groups of species to be targeted for inventory.

Over time, this strategy will allow us to collect data 1) for species or species groups we do not have sufficient information to determine their level of conservation need, or 2) for species that are important or indicator species for health of certain communities, or 3) for species used as measures of success in a comprehensive approach to fish and wildlife management.

Categorizing the Levels of Conservation Need

Within each component, focus areas, community types, and species were prioritized into three Tiers, based on their level of conservation need. Likewise, all species were prioritized for Inventory needs using similar definitions.

Tier I: Greatest conservation need. Montana Fish, Wildlife & Parks has a clear obligation to use its resources to implement conservation actions that provide direct benefit to these species, communities and focus areas.

Tier II: Moderate conservation need. Montana Fish, Wildlife & Parks could use its resources to implement conservation actions that provide direct benefit to these species, communities and focus areas.

Tier III: Lowest conservation need. Although important to Montana's wildlife diversity, these communities, species and focus areas are either abundant/widespread or are believed to have adequate conservation already in place.

Tier IV: Species that are non-native, incidental or on the periphery of their range and are either expanding or very common in adjacent states.

How Montana's Comprehensive Strategy Will Work

Montana's strategy is intended to be dynamic and is based on the concept that fine-scale information for any of Montana's species will be used to continually refine and adjust the classification for that species when appropriate. This will be accomplished using the inventory component of the strategy. In turn, modifications to the list of species in greatest need of conservation should help re-direct priorities in terms of the most at risk community types. This information will then be used to direct our attention to new geographical areas of Montana and help focus the delivery of the appropriate conservation efforts that help address the most critical, where possible. We have made every effort to use existing management plans to describe the conservation concerns and needs for focus areas, community types and species. In this way the Strategy attempts to tie together many different plans at different levels in order to facilitate collaboration. A full list of conservation and management plans can be found in Table 1.

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1310

How To Navigate This Strategy

Most users will be interested in particular components of the Strategy. Readers should decide if they are interested in landscape level conservation, a particular community type or a specific species.

If you are Interested in Landscape or Community Scale Conservation

Refer to the Table of Contents and directly reference the Ecotype (Component I) or the Community Type (Component II) that you are interested in. For example, if you are interested in Montane Forests of western Montana, use the table of contents to locate Montane Forest and there you will find listed all focus areas individually under that Ecotype. On the other hand if you are interested in Riparian and Wetland Community Types, refer to the table of contents under Component II and proceed to the appropriate page. Within the focus areas and community types you will find descriptions and a map of the area or type, fish and wildlife and habitats associated with them, conservation concerns and needs as well as a reference to selected management plans.

If you are Interested in Species Scale Conservation

If you are interested in a particular fish or wildlife species, you can use the table of contents and look under Component III to locate the page number for any Tier I species you are interested in. You can also use the Species Reference Guide (Table 2 *not yet complete for draft review*) and locate the page numbers where you can find any species in the Strategy, regardless of Tier. Tables for the focus areas, community types and inventory needs associated with a species can also provide additional information such as lists of other species that are associated comprehensively with similar areas or community types.

If you are Interested in Inventory

Proceed directly to the fourth component of the Strategy. Species groups and individual species that are in greatest need of inventory are listed taxonomically and then alphabetically. Once you have found the species or group of interest, coded symbols are provided to the right of that species or group that indicate some of the reasons why they are in greatest need. A legend is provided for these codes at the beginning of the section for that Component.

Component I: Ecotype Focus Areas of Greatest Conservation Need

"This is a strategy to focus resources and efforts toward geographical areas where they can benefit the largest number of species and communities in need of conservation."

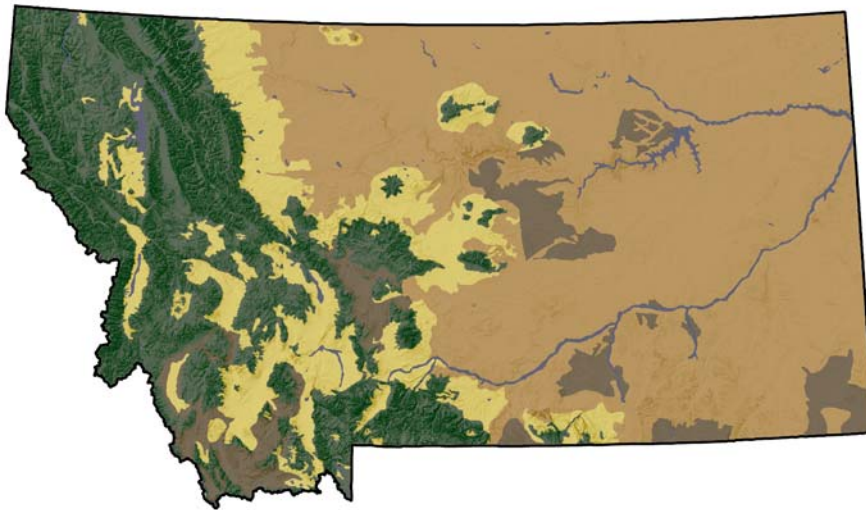


Figure 1. Ecotypes of Montana

Montana Fish, Wildlife & Parks habitat programs currently use five ecotypes to describe the broad areas of Montana's landscape that have similar characteristics; Intermountain/foothill grassland, Montane Forest, Plains Grassland, Plains Forest, Shrub Grassland, and Riparian (Montana Fish, Wildlife & Parks 1991). For the Strategy, we combined the Plains Grassland and Plains Forest into one ecotype. We also defined Riparian as a community type instead of an ecotype since it occurs throughout all of the other ecotypes.

Within each of the ecotypes, Tier I (greatest need of conservation) geographic focus areas have been identified for all terrestrial and aquatic areas of the state (Appendices H and I). Aquatic and terrestrial areas were identified separately to facilitate implementation of conservation strategies, with the understanding that overlap does exist. Only the areas in greatest need of conservation are described in the body of the Strategy. These areas guide our attention to locations that offer some of the best opportunity to conserve Montana's community types and fish and wildlife species in greatest need of conservation.

The habitats and species of greatest conservation need are listed for each area along with strategic conservation concerns and needs. Montana Fish, Wildlife & Parks should leverage existing programs to conserve these areas alongside other state and federal agencies, private organizations and the public. Specific agencies, organizations or individuals will be effective at implementing many of the conservation strategies. However, landowner based and collaborative projects should be encouraged. Conservation efforts that are under way by various groups that address the conservation strategies should be supported. In some cases working groups might need to be initiated in order to begin addressing the conservation concerns. A good model for how working groups could operate is the Blackfoot Challenge. The Blackfoot Challenge is a Montana group that coordinates management of the Blackfoot River, its tributaries, and adjacent lands. It is organized locally and known nationally as a model for preserving the rural character and natural beauty of a watershed and surrounding areas. Although its charter dates to 1993, Blackfoot landowners have played an instrumental stewardship role since the late 1970s—bringing conservation easement legislation, walk-in hunting areas and recreation corridor management to Montana. The Blackfoot Challenge can be contacted at Blackfoot Challenge PO Box 103, Ovando, MT 59854, 406 793-3900.

Intermountain/Foothill Grassland Ecotype

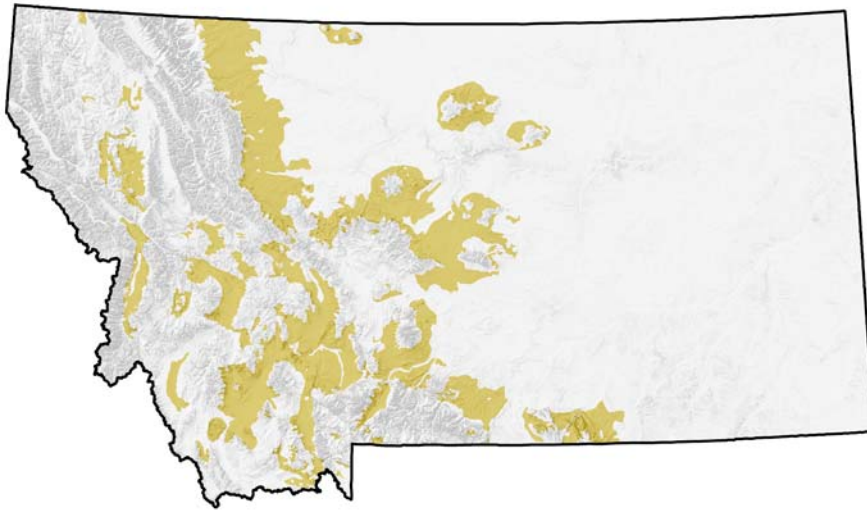


Figure 2. Intermountain/Foothill Grassland Ecotype

Intermountain/foothill grassland is a mosaic of private and public lands that extends from the glaciated Flathead River Valley to the north, south to the Centennial Valley, and east to Rocky Mountain Front, where there remains some of Montana's most diverse fish and wildlife habitats. This western Montana ecotype harbors more wildlife communities than any other in Montana. It also harbors Montana's greatest concentrations of human population in and near the towns of Kalispell, Missoula, Helena, and Bozeman. The attraction for wildlife and for people is western Montana's broad, lush and sweeping valleys cradled by the peaks of the Rocky Mountains. The intermountain/foothill grasslands are cut and formed by meandering rivers that create core riparian zones and wetland areas that often include glacial lakes and potholes that attract nesting waterbirds. Addressing the challenges that accompany the interface between human settlement and fish and wildlife and their habitats will be critical to the conservation of these areas.

Landscape Characteristics

The Intermountain/Foothill Grassland ecotype includes 13,414,271 acres and represents 14.3 % of Montana's land area. The intermountain/foothill ecotype generally lies on level to moderate topography at valley bottoms or lower slopes of mountains with the Flathead, Clark Fork, Bitterroot, Missouri, Big Hole, Beaverhead, Jefferson, Gallatin, Madison, Yellowstone and Blackfoot rivers cutting through the ecotype. Elevations are lowest in some of the northwestern valley locations, in some cases below 3,000 feet. Elevations between 3,000 and 4,000 feet occur broadly in the Flathead/Mission and Tobacco valleys. The upper Townsend, Gallatin, and Blackfoot valleys are mostly between 4,000 and 5,000 feet as well as much of the foothill region to the east of the mountains.

The Jefferson, Madison, Shields/Smith, Paradise, and Deerlodge valleys range from 4,500 to 5,500 feet. Due to glaciation, the northern part of the Flathead Basin contains hundreds of potholes, many of which retain water throughout the average summer.

Soils

Floors of the intermountain valleys of southwestern Montana are mostly composed of thousands of feet of tertiary valley fill deposited at the end of the first stage of mountain building. During the ice ages, the cordilleran ice sheet covered the northern part of the Flathead Basin at various times. Glacial Lake Missoula, formed from melt water from this ice sheet, reached south into the Bitterroot Valley and west into what is now Washington. Sediments from this lake, plus outwash materials from the ice sheet cover most of the valley bottoms of the southern part of the Flathead Basin (i.e., south Mission Valley, Hot Springs Valley). Lake sediments farther south (Missoula and Bitterroot Valleys) apparently have been eroded away, exposing tertiary fill. The northern parts of the Flathead Basin as well as the Tobacco Valley are underlain by glacial till.

In some places, the foothill areas are underlain by outwash from the adjacent mountains, however, more commonly the substrate is some form of sedimentary bedrock. The foothills along the east front (Bowman's Corner to the Canadian border), the area north and east of Livingston, and some of the area surrounding the Bearpaw and Little Rocky mountains is underlain by moderately hard sandstones and soft shales of the Cretaceous (beginning about 100 million years ago) Eagle to Willow Creek formations. Part of the foothill areas of these mountains also comprises Cretaceous soft black marine shales (Colorado Group, Montana Group, Pierre Shale), Cretaceous soft sandstones, siltstones, and claystones (Fox Hills Sandstone, Kootenai Formation). Some of these sedimentary strata may be gently to steep uplift as a result of nearby mountain building.

Most of the soils in this ecotype (82%, 20,500 mi²) are described as well developed with dark topsoil horizons, clay 'B' horizons, having cool temperature regime and occurring under semiarid to subhumid moisture conditions.

Climate

The climate of the intermountain/foothills grassland ecotype varies considerably from one end to another; generally there is more resemblance to the climate of the plains grassland than to adjacent mountains. The northwestern valleys are influenced more by pacific storms in winter and have a more maritime climate than the more southerly valleys. Temperatures there tend to be milder during the winter and there is a greater proportion of precipitation received during the winter. Arctic climate outbreaks affect the entire ecotype but to a lesser extent the northern foothills.

1494

1495 Annual temperatures average 44⁰ F. throughout much of the Gallatin, Townsend,
 1496 Helena, northern Jefferson, Bitterroot and Flathead/Mission valleys. In these
 1497 valleys some areas may have annual temperatures of 45⁰ F. The Blackfoot,
 1498 Madison, Paradise, and Jefferson/Beaverhead valleys are about a degree colder
 1499 because of elevation and/or topography that favor the formation of extreme
 1500 temperature inversions even in summer. Foothill areas in central and southern
 1501 Montana experience about the same annual average temperatures as the colder
 1502 intermountain valleys. The coldest part of the ecotype is the northern foothills
 1503 along the eastern front. Some parts of this area sustain average temperatures of
 1504 39⁰ to 40⁰ F.

1505

1506 Although maximum daily temperatures in the northwest valleys are similar to
 1507 those in the Gallatin/Townsend/Helena valleys, nighttime temperatures average
 1508 about 5 degrees warmer in the former areas. This generates mean January daily
 1509 temperatures ranging from 22⁰ to 25⁰ F. in the northwest and 20⁰ to 23⁰ in the
 1510 lower southwest valleys. Temperatures in the colder valleys of the southwest
 1511 and west central areas range from 19⁰ to 21⁰ F. in January. In foothill locations,
 1512 January temperatures range from 15⁰ to 22⁰ F.

1513

1514 Mean daily temperatures in July are highest in the Gallatin, Townsend, Helena,
 1515 northern Jefferson, Bitterroot, and Mission valleys. In the warmest parts of these
 1516 valleys, daily maximums range from 85⁰ to 86⁰ F. In the Madison,
 1517 Jefferson/Beaverhead, Paradise and Flathead valleys, and most of the foothill
 1518 areas, maximum daily temperatures are about a degree lower. The coldest
 1519 valleys in the extreme southwest and west central areas attain maximums from
 1520 80 to 82 degrees. Highest July nighttime temperatures in the ecotype occur in
 1521 the Helena and Townsend valleys where they range from 49⁰ to 50⁰ F. The
 1522 Gallatin valley is about a degree cooler. A degree cooler than that is nighttime
 1523 temperatures in the lower Jefferson, Bitterroot, and Flathead/Mission valleys and
 1524 most of the foothill region. Nighttime temperatures of 43⁰ to 46⁰ F. are
 1525 experienced in the west central and extreme southwestern valleys.

1526

1527 The protection afforded the intermountain valleys by the mountains is reflected
 1528 by the generally much higher annual extreme minimum temperatures contrasted
 1529 with most of the area to the east. The Mission and Bitterroot valleys are the only
 1530 parts of Montana with significant areas in plant hardiness zone 5 (mean annual
 1531 minimums in the minus teens). The rest of these valleys along with the
 1532 Jefferson/Beaverhead, Gallatin, Madison, Townsend, Helena, Deerlodge,
 1533 Blackfoot, Missoula and Tobacco valleys, are in hardiness zone 4B (mean
 1534 annual minimums in the -21⁰ to -25⁰ F. range). The central and southern foothill
 1535 area is mostly in zone 4A (mean annual minimums in the -26⁰ to -30⁰ F. range).
 1536 The northern foothill region is partially in Zone 3 (mean annual minimums from -
 1537 31⁰ to -40⁰ F.).

1538

The highest annual extreme maximum temperatures occur in the Mission valley where much of this area reaches 98⁰ to 99⁰ F. on average each year. The Flathead, Missoula, part of the Deerlodge, the lower Jefferson, Gallatin, and Townsend and Helena valleys normally reach 95⁰ to 97⁰ F. This is also the case for the southern and central foothill region.

The longest frost-free season exists in the lower Helena valley, and the central and southern foothill sections. Here the season ranges from 120 to 130 days. Lower portions of the Gallatin valley, the Townsend valley, and the Flathead/Mission valley have frost free season ranging from 100 to 125 days. Seasons in the Jefferson, Madison, Paradise, Bitterroot and Missoula valleys last from 90 to 110 days. Other valleys and the northern foothill areas have seasons ranging from 70 to 100 days.

The intermountain valleys and foothills are basically semi-arid, but considerably wetter than the plains grasslands. Mean annual precipitation overall is 15.4 inches. The foothill portion of the ecotype generally is wetter than the intermountain valley portion. Much larger expanses of area receiving more than 16 inches annually occur in the former than the latter area. Broad areas receiving between 10 and 12 inches are found in the Jefferson/Beaverhead valleys, while parts of the Jefferson/Beaverhead/Centennial and Helena valleys get less than 10 inches annually. The Blackfoot valley and eastern portions of the Flathead/Mission valley receive between 12 and 16 inches while western parts of the Flathead/Mission Valley tend to be drier.

Reflecting the stronger maritime influence in the northwest, those valleys tend to receive a smaller proportion of their precipitation in the growing season than do the southwestern valleys and most of the foothill regions. The percentage of moisture falling in the growing season for the Flathead/Mission, Missoula, and Bitterroot valleys ranges from 37 to 45 percent, with a portion of the Mission valley slightly higher than that. The extreme southwestern valleys (Jefferson/Beaverhead, Madison) and the northern and central foothill region collect 52 to 60 percent of the water during the growing season. Most other areas are in the range of 45 to 55 percent.

Anthropogenic

The Intermountain/Foothills Grassland Ecotype is diverse both in land management and its uses by humans. Primary recreational activities include hiking, mountaineering, hunting, biking, snowmobiling, wildlife watching, and skiing. The primary industries in this ecotype are building/construction, farming, ranching, mining and tourism. The breakdown of landowner stewardship for intermountain/foothills grassland ecotype is as follows:

U.S. Federal Agencies: 1,007,758 acres, which include
BLM: 494,520 acres

1585 USFS: 408,403 acres
1586 USFWS: 64,556 acres
1587 NPS: 18,286 acres
1588 State Agencies: 892,545 acres
1589 Tribal Lands: 1,091,650 acres
1590 Private: 10,187,909 acres
1591 City & County: 6,487 acres

1592

1593 **Vegetation**

1594

1595 Plant community composition is influenced primarily by the total annual
1596 precipitation ranging from 8 to more than 20 inches, yearly precipitation
1597 distribution, and soil characteristics. The yearly precipitation distribution and to a
1598 certain extent the total precipitation are related to general geographic location.
1599 Northern valleys and foothills tend to receive more total precipitation than more
1600 southern areas, while northwestern valleys have a more maritime (winter/spring
1601 wet) precipitation. This has an impact on the distribution of major grass species.
1602 Most of the potential natural grassland communities within this ecotype can be
1603 perceived as different combinations of six or seven major grass species
1604 accompanied by a number of subordinate grass and forb species.

1605

1606 Rough fescue (*Festuca scabrella*) extends southward into Montana from
1607 Canada, its center of distribution (Moss and Campbell 1947, Coupland and
1608 Brayshaw 1953, Tisdale 1947, Stickney 1960). Rough fescue is most abundant
1609 and widespread in Northwestern Montana on both sides of the Divide, declining
1610 southward and penetrating below 46° only in the Gravelly and Madison ranges.
1611 The east most occurrences are near Lewistown at the foot of the Judith
1612 Mountains.

1613

1614 Idaho fescue (*Festuca idahoensis*) occurs throughout the intermountain/foothill
1615 ecotype wherever moisture conditions are favorable, becoming at least a
1616 subordinate species at 15 inches of annual precipitation (Ross and Hunter 1976).
1617 As well as being a component of most rough fescue communities, Idaho fescue
1618 forms habitat types with bluebunch wheatgrass (*Agropyron spicatum*) in most of
1619 the medium elevations of southwestern Montana and with western thickspike
1620 wheatgrass (*Agropyron dasystachyum*) in foothill areas just east of the
1621 mountains where there is enough moisture (Mueggler et al. 1980). Idaho fescue
1622 rarely occurs as the sole dominant grass. The two Idaho fescue habitat types
1623 usually contain prairie junegrass (*Koeleria cristata*) as a subordinate grass.
1624 Forbs commonly associated with Idaho fescue include silky lupine (*Lupinus*
1625 *sericeus*), arrowleaf balsamroot (*Balsamorhiza sagittata*), sticky geranium
1626 (*Geranium viscosissimum*), phlox (*Phlox kelseyi*), blanketflower (*Gaillardia*
1627 *aristata*), and pussytoes (*Antennaria microphylla*).

1628

1629 Bluebunch wheatgrass is the most widely spread major forage grass in Montana,
1630 occurring at least as co-dominant on some sites statewide. In the

intermountain/foothills grassland ecotype it is a dominant grass on all upland sites within the 10 to 14 inches precipitation zone (Ross et al. 1976). On fine textured soils bluebunch grass forms plant communities where western wheatgrass and thickspike wheatgrass are co-dominants. Prairie junegrass is usually present and fairly abundant. Other common species include big sagebrush (*Artemisia tridentate ssp. wyomingensis*), milkvetches (*Astragalus* spp.), biscuitroot (*Lomatium* spp.), sandberg bluegrass (*Poa sandbergii*), hairy goldenaster (*Chrysopsis villosa*), and green needlegrass (*Stipa viridula*). Sites with medium textured, well-drained, shallow soils support little western wheatgrass compared to the finer textured soils but more species like needle-and-thread (*Stipa comata*), sandberg bluegrass and sometimes blue grama (*Bouteloua gracilis*) as co-dominants. Such sites occupy about 9% (2,325 miles²) of the ecotype. These communities may contain a variety of shrub species, but those in which shrubs are dominants are included in the Shrub/grassland ecotype. On sandy sites, bluebunch wheatgrass is a major vegetation constituent along with needle-and-thread, Indian ricegrass (*Oryzopsis hymenoides*), and sometimes prairie sandreed (*Calamovilfa longifolia*). Other species that may be found are aromatic sumac (*Rhus aromatica*), threadleaf sedge (*Carex filifolia*) and yucca (*Yucca glauca*). Within the 15 to 19 inch precipitation zone, bluebunch wheatgrass shares dominance with rough fescue in the northwest and Idaho fescue in the southwest and south central areas of Montana.

Needle-and-thread grass occurs as a community type in some valleys of the extreme southwest (Mueggler et al. 1980). This type is found on well-drained, shallow soils that might be limy. Other species include western and thickspike wheatgrass, prairie junegrass, threadleaf sedge, and fringed sedge (*Carex crinita*).

Other sites within the intermountain/foothill grassland ecotype include saline lowlands that support major grasses such as basin wildrye (*Elymus cinereus*), Nuttall alkaligrass (*Puccinellia nuttalliana*), alkali cordgrass (*Spartina gracilis*), saltgrass (*Distichlis stricata*), alkali bluegrass (*Poa juncifolia*), kelsey phlox (*Phlox kelseyi*), and occasionally greasewood (*Sarcobatus vermiculatus*). Also found are subirrigated areas and wetlands that are often dominated by various species of willow (*Salix* spp.) and a variety of hydromorphic grasses, sedges and rushes. These might include Canada reedgrass (*Calamagrostis Canadensis*), cattails (*Typha latifolia*), Baltic rush (*Juncus balticus*), and basin wildrye (*Leymus cinereus*).

Terrestrial Conservation Focus Areas in Greatest Need (Tier I)

Bitterroot/Frenchtown Valleys (406,859 acres)



Figure 3. Bitterroot/Frenchtown Valleys Focus Area

The Bitterroot/Frenchtown Valley is dominated by views of the jagged peaks of the Bitterroot Range to the west and the lower Sapphire Mountains. The Bitterroot River bisects the valley floor from Idaho north to Missoula. The valleys are arid, flat or gently rolling landscapes two to 15 miles wide. While valley supports many habitats--from grassland and riparian to forests and sagebrush--most of the area is now in agricultural production. The rolling mountain foothills at the valley edges are important elk, white-tailed deer, and mule deer winter range. In the valley bottoms, the cottonwood riparian habitats are some of the most productive wildlife habitats in the state and are home to a wide variety of birds, mammals, reptiles and amphibians.

Landscape Characteristics

This subsection contains intermountain valleys that formed in alluvium, outwash, and lacustrine sediments. Elevations range from 3,000 to 4,400 feet. Drainage density is slight. Wetlands occur along both the Clark Fork and Bitterroot rivers. Mean annual precipitation ranges from 11 to 25 inches, about 40 to 60 percent falling as snow. The soil temperature and moisture regimes are frigid and typic ustic. The primary natural disturbances are flooding and fire. Land use is predominantly extensive urban/suburban development and agricultural activities. The breakdown for land stewardship in the Bitterroot/Frenchtown Valleys is as follows:

U.S. Federal Agencies:	42,935 acres, which include
USFS:	40,155 acres

1709 USFWS: 2,780 acres
 1710 State Agencies: 14,147 acres
 1711 Private: 348,727 acres

1712

1713 Associated Habitats

1714

Habitat	Habitat Tier	Percentage of Area
Mixed Xeric Forest	III	3.57
Wetland & Riparian	I	3.72
Urban	III	3.73
Douglas Fir	II	4.48
Sagebrush	I	4.57
Agricultural Lands - Dry	III	5.73
Mixed Mesic Forest	II	6.05
Ponderosa Pine	II	6.65
Mixed Mesic Shrubs	II	8.52
Altered Herbaceous	II	10.17
Agricultural Lands - Irrigated	III	11.19
Low/ Moderate Cover Grasslands	I	25.11

1715

1716

1717

Note: A total of 93.50% of the Bitterroot/Frenchtown Valleys area is represented. 6.50% is made up of a combination of other habitat types.

1718

1719

Associated Species of Greatest Conservation Need

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1721

There are a total of 342 terrestrial vertebrate species that are found within the Bitterroot/Frenchtown Valleys Focus Area. All associations can be found within Table 10.

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1723

1724

1725

Amphibians: Coeur D'Alene Salamander, Boreal Toad, and Northern Leopard Frog

1726

1727

1728

Birds: Common Loon, Trumpeter Swan, Harlequin Duck, Bald Eagle, Long-billed Curlew, Black Tern, Flammulated Owl, Black-backed Woodpecker, and Olive-sided Flycatcher

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1730

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1732

Mammals: Townsend's Big-eared Bat, Northern Bog Lemming, Gray Wolf, and Grizzly Bear

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Conservation Concerns

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1741

- Habitat loss, degradation and fragmentation especially as a result of human population growth
- Invasive and exotic plant and animal species
- Development of transportation infrastructure
- Unsustainable domestic livestock grazing and timber harvest practices

1742

1743 **Conservation Strategies**

1744

- 1745 • Support strategic conservation easements by conservation organizations
- 1746 or public agencies
- 1747 • Promote sustainable land management practices on public lands
- 1748 • Support state/federal tax incentives which discourage habitat
- 1749 fragmentation
- 1750 • Participate in partnerships to develop and implement weed control
- 1751 strategies
- 1752 • Improve grazing and timber management to enhance biological diversity
- 1753 on existing managed/protected areas
- 1754 • Promote further development of county ordinances that help to guide
- 1755 future residential and commercial development
- 1756

1757 **References**

1758

1759

Central Montana Broad Valleys (2,604,058 acres)



Figure 4. Central Montana Broad Valleys Focus Area

These central valleys include the areas from Three Forks, where the Missouri River begins, north through the Helena Valley and White Sulfur Springs, generally east of the Belt Mountains. The valleys are situated among the foothills of the Rocky Mountains where precipitation is reduced by the rain shadow effect. Low and moderate cover grasslands dominate the valley floors and the dry environment highlights the importance of the riparian areas along the Missouri, Smith and other rivers and streams. Higher elevations capture enough precipitation to support fir, spruce and pine forests.

Landscape Characteristics

This subsection has broad intermontane valleys that formed in Tertiary sediments and Quaternary alluvial deposits derived from volcanic rocks, shale, and sandstone. Elevations range from 3,750 to 6,800 feet. Drainage density is low. Mean annual precipitation ranges from 10 to 25 inches, about 30 percent falling as snow. The soil temperature and moisture regimes are frigid and aridic ustic. The primary natural disturbances are fire and flooding. Land use is predominantly livestock grazing, crop production, and urban/suburban development. The breakdown for land stewardship in the Central Montana Broad Valley is as follows:

U.S. Federal Agencies:	101,375 acres, which include
BLM:	67,460 acres
USFS:	21,313 acres
USFWS:	556 acres
State Agencies:	162,163 acres
Private:	2,331,192 acres

Associated Habitats

Habitat	Habitat Tier	Percentage of Area
Moderate/ High Cover Grasslands	I	2.19
Rock	III	3.83
Wetland & Riparian	I	5.24
Sagebrush	I	8.16
Very Low Cover Grasslands	I	8.45
Agricultural Lands - Irrigated	III	9.45
Agricultural Lands - Dry	III	11.08
Low/ Moderate Cover Grasslands	I	38.26

Note: A total of 86.65% of the Central Montana Broad Valleys area is represented. 13.35% is made up of a combination of other habitat types.

Associated Species of Greatest Conservation Need

There are a total of 317 terrestrial vertebrate species that are found within the Central Montana Broad Valleys Focus Area. All associations can be found within Table 11.

Amphibians: Boreal Toad and Northern Leopard Frog

Birds: Common Loon, Bald Eagle, Sage-grouse, Mountain Plover, Long-billed Curlew, Black Tern, and Burrowing Owl

Mammals: Townsend's Big-eared Bat, Pallid Bat, Black-tailed Prairie Dog, Grizzly Bear, and Lynx

Conservation Concerns

- Habitat loss, degradation and fragmentation especially as a result of human population growth
- Invasive and exotic plant and animal species
- Unsustainable domestic livestock grazing and timber harvest practices

Conservation Strategies

- Support strategic conservation easements by conservation organizations or public agencies
- Promote sustainable land management practices on public lands
- Support state/federal tax incentives which discourage habitat fragmentation
- Participate in partnerships to develop and implement weed control strategies

- 1828 • Improve grazing and timber management to enhance biological diversity
- 1829 on existing managed/protected areas
- 1830 • Promote further development of county ordinances that help to guide
- 1831 future residential and commercial development
- 1832

1833 **References**

1834

1835 The Nature Conservancy. 2000. Middle Rockies-Blue Mountains Ecoregional

1836 Conservation Plan. Prepared by the Middle Rockies – Blue Mountains

1837 Planning Team. 58 pgs + appendices.

1838

1839

Deerlodge Valley (175,260 acres)

Figure 5. Deerlodge Valley Focus Area

One of several broad, intermountain valleys located in southwestern Montana, the north-flowing Clark Fork River bisects the Deerlodge Valley along an east-west axis. Cattle ranching and hay production are the chief agricultural activities. Native bunchgrasses occur on the valley foothills, which provide important elk and deer winter range and supports other diverse nongame wildlife.

Landscape Characteristics

This subsection is comprised of an intermontane valley that formed in Tertiary sedimentary rocks and recent stream deposits. Elevations range from 4,400 to 6,000 feet. Drainage density is moderate. Mean annual precipitation ranges from 11 to 16 inches, about 20 percent falling as snow. The soil temperature and moisture regimes are frigid and aridic ustic. The primary natural disturbances are flooding and mass wasting. Land use is predominantly agriculture, livestock grazing, and urban/suburban development. The breakdown for land stewardship in the Deerlodge Valley is as follows:

U.S. Federal Agencies:	1,792 acres, which include
BLM:	62 acres
NPS:	1,730 acres
State Agencies:	14,023 acres
Private:	159,445 acres

Associated Habitats

Habitat	Habitat Tier	Percentage of Area
Very Low Cover Grasslands	I	2.00
Mixed Barren Sites	III	2.14
Altered Herbaceous	II	3.22
Mixed Xeric Shrubs	I	4.70
Sagebrush	I	4.96
Moderate/ High Cover Grasslands	I	5.37
Wetland & Riparian	I	6.14
Agricultural Lands - Irrigated	III	6.99
Mixed Mesic Shrubs	II	7.18
Low/ Moderate Cover Grasslands	I	51.73

Note: A total of 94.42% of the Deerlodge Valley area is represented. 5.58% is made up of a combination of other habitat types.

Associated Species of Greatest Conservation Need

There are a total of 260 terrestrial vertebrate species that are found within the Deerlodge Valley Focus Area. All associations can be found within Table 12.

Amphibians: Boreal Toad and Northern Leopard Frog

Birds: Common Loon, Trumpeter Swan, Harlequin Duck, Bald Eagle, Long-billed Curlew, and Black Tern

Mammals: Townsend's Big-eared Bat, and Lynx

Conservation Concerns

- Habitat loss, degradation and fragmentation especially as a result of human population growth
- Invasive and exotic plant and animal species
- Unsustainable domestic livestock grazing and timber harvest practices

Conservation Strategies

- Support conservation easements by conservation organizations or public agencies
- Promote sustainable land management practices on public lands
- Support state/federal tax incentives which discourage habitat fragmentation
- Participate in partnerships to develop and implement weed control strategies

- 1905 • Improve grazing and timber management to enhance biological diversity
- 1906 on existing managed/protected areas
- 1907 • Promote further develop of county ordinances that help to plan for and
- 1908 manage development
- 1909

1910 **References**

- 1911
- 1912 The Nature Conservancy. 2000. Middle Rockies-Blue Mountains Ecoregional
- 1913 Conservation Plan. Prepared by the Middle Rockies – Blue Mountains Planning
- 1914 Team. 58 pgs + appendices.
- 1915
- 1916

Flathead River Valley (1,586,787 acres)



Figure 6. Flathead Valley Focus Area

The glaciated Flathead Valley of northwestern Montana lies among majestic mountain ranges and cradles the Flathead River. The primary stem of the Flathead, the Stillwater and Tobacco rivers are among the major headwater rivers of the Columbia basin. The valley supports diverse wetland and aquatic communities including glacial lakes, ponds, spring creeks, riparian swamps, cottonwood forests, oxbow lakes, and Flathead Lake, the nation's largest natural freshwater lake west of the Mississippi. The northern and southern reaches of the valley still support intact palouse prairie habitats interspersed with wetlands and forest. This region historically has provided habitat for nesting, migrating, and wintering waterfowl, and a range of habitats for upland game birds, raptors, shorebirds, colonial waterbirds and other resident and migratory species. It also contains important seasonal habitat for black bears, grizzly bears, mountain lions, elk, mule deer, and white-tailed deer. The rich resources of the valley floor, the riparian/wetlands, grasslands, and foothills--are primarily in private ownership, and are under extreme development pressure.

Landscape Characteristics

This subsection is composed of an intermontane basin that formed alluvium, glacial outwash, and lacustrine sediments underlain by argillite, siltite, and dolomite. Elevations range from 2,300 to 4,500 feet. Drainage density is low to moderate. Mean annual precipitation ranges from 14 to 25 inches, about 50 percent falling as snow. The soil temperature and moisture regimes are frigid and typic xeric. The primary natural disturbances are fire and flooding. Land use is predominantly agriculture and timber harvest on public and to a greater degree private lands, as well as rural/suburban development. The breakdown for land stewardship in the Flathead River Valley is as follows:

1948
 1949 U.S. Federal Agencies: 132,943 acres, which include
 1950 USFS: 108,047 acres
 1951 USFWS: 24,711 acres
 1952 State Agencies: 98,904 acres
 1953 Tribal Lands: 456,713
 1954 Private: 1,318,307 acres
 1955

1956 Associated Habitats

Habitat	Habitat Tier	Percentage of Area
Lodgepole Pine	III	2.54
Wetland & Riparian	I	2.85
Mixed Mesic Shrubs	II	2.85
Ponderosa Pine	II	2.92
Mixed Xeric Forest	III	3.06
Agricultural Lands - Dry	III	3.40
Altered Herbaceous	II	4.22
Sagebrush	I	6.63
Douglas Fir	II	7.26
Water	III	9.29
Agricultural Lands - Irrigated	III	9.88
Low/ Moderate Cover Grasslands	I	15.56
Mixed Mesic Forest	II	17.71

1958
 1959 Note: A total of 88.16% of the Flathead River Valley area is represented. 11.84% is made up of a combination of other
 1960 habitat types.

1961 Associated Species of Greatest Conservation Need

1962
 1963
 1964 There are a total of 344 terrestrial vertebrate species that are found within the
 1965 Flathead River Valley Focus Area. All associations can be found within Table 13.

1966
 1967 **Amphibians:** Boreal Toad and Northern Leopard Frog
 1968

1969 **Birds:** Common Loon, Trumpeter Swan, Bald Eagle, Columbia Sharp-tailed
 1970 Grouse, Long-billed Curlew, Black Tern, Flammulated Owl, Black-backed
 1971 Woodpecker, and Olive-sided Flycatcher
 1972

1973 **Mammals:** Townsend's Big-eared Bat, Northern Bog Lemming, Grizzly Bear,
 1974 Gray Wolf, and Lynx
 1975

1976 Conservation Concerns

- 1977
- 1978 • Habitat fragmentation as a result of human population
- 1979 growth/development

- 1980 • Wetland and riparian habitat degradation
- 1981 • Water quality degradation
- 1982 • Invasive or exotic plant and animal species
- 1983 • Unsustainable domestic livestock grazing and timber harvest practices
- 1984 • Altered fire regimes

1985

1986 **Conservation Strategies**

1987

- 1988 • Support conservation easements and other methods that help protect
- 1989 critical habitat on private lands
- 1990 • Support watershed, riparian & grassland restoration opportunities with
- 1991 Confederated Salish and Kootenai Tribes, Montana Department of
- 1992 Environmental Quality, US Natural Resource Conservation, & Partners for
- 1993 Wildlife Program
- 1994 • Work with Department of Transportation and Federal Highway
- 1995 Commission to effectively mitigate impacts of highway construction
- 1996 • Support management of grazing to maintain riparian vegetation,
- 1997 streambank and channel stability in excellent condition
- 1998 • Support efforts to eradicate exotic or invasive plant species when
- 1999 appropriate

2000

2001 **References**

2002

2003 Confederated Salish and Kootenai Tribes and Montana Fish, Wildlife & Parks.
2004 2003. Flathead Subbasin Plan Assessment: Executive Summary. NWPCC.
2005 Portland, OR.

2006

2007 Kootenai Tribe of Idaho and Montana Fish, Wildlife & Parks. 2004. Public Review
2008 Draft Kootenai Subbasin Plan. Executive Summary. Report prepared for the
2009 Northwest Power and Conservation Council. Portland, OR.

2010

2011 The Nature Conservancy. 2004. Canadian Rocky Mountains Ecoregional
2012 Assessment. Four volumes, including Report, Appendices, Conservation Area
2013 Descriptions & Maps.

2014

2015 United States Fish & Wildlife Service. 2004. Conservation Focus Areas of the
2016 Great Divide: A vast region encompassing the Upper Missouri, Yellowstone and
2017 Upper Columbia watersheds. Publisher: USFWS, Benton Lake Wildlife Refuge,
2018 Great Falls, MT. 77pgs.

2019

2020

Little Belt Foothills (839,541 acres)

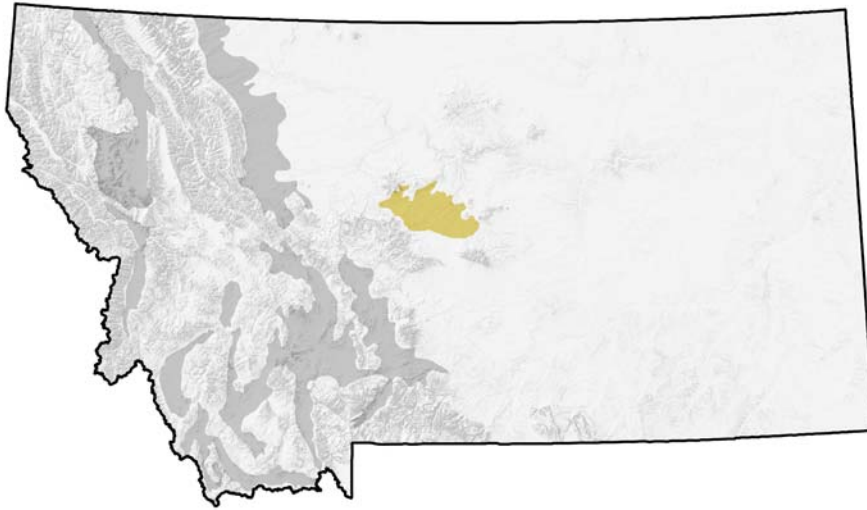


Figure 7. Little Belt Foothills Focus Area

The Little Belt Foothills cover the Judith Basin, a large mountain foothill grassland community rimmed by the Little Belt, Highwood, Moccasin and Big Snowy mountains. The Judith River, tributary to the Missouri River, is the basin's primary drainage. Large, flat grassland benches define the high foothills. The lower elevations are comprised of rangeland interspersed with croplands and sprawling terraces dominate the lower elevations. While about 30 percent of the landscape in the Judith Basin is farmed, the remaining areas support bunchgrass and sagebrush grasslands.

Landscape Characteristics

This subsection is composed of foothills, terraces, and fans that formed in shale, siltstone, and terrace deposits. Elevations range from 3,500 to 5,000 feet. Drainage density is moderate. Mean annual precipitation ranges from 15 to 19 inches, having approximately 40 to 50 percent falling as snow. The soil temperature and moisture regimes are frigid and ustic. The primary natural disturbance is drought. Land use is predominantly livestock grazing at higher elevations, with a combination of cropping and livestock grazing at lower elevations. The breakdown for land stewardship in the Little Belt Foothills is as follows:

U.S. Federal Agencies:	16,309 acres
BLM:	15,197 acres
USFS:	1,112 acres
State Agencies:	77,159 acres
Private:	746,073 acres

Associated Habitats

Habitat	Habitat Tier	Percentage of Area
Mixed Mesic Shrubs	II	2.04
Very Low Cover Grasslands	I	2.36
Wetland & Riparian	I	7.34
Moderate/ High Cover Grasslands	I	11.69
Agricultural Lands - Irrigated	III	18.99
Agricultural Lands - Dry	III	22.88
Low/ Moderate Cover Grasslands	I	29.12

Note: A total of 94.42% of the Little Belt Foothills area is represented. 5.58% is made up of a combination of other habitat types.

Associated Species of Greatest Conservation Need

There are a total of 293 terrestrial vertebrate species that are found within the Little Belt Foothills Focus Area. All associations can be found within Table 14.

Amphibians: Boreal Toad and Northern Leopard Frog

Birds: Bald Eagle, Sage-grouse, Mountain Plover, Long-billed Curlew, Black Tern, and Burrowing Owl

Mammals: Townsend's Big-eared Bat, Black-tailed Prairie Dog, and Black-footed Ferret

Reptiles: Western Hognose Snake and Milk Snake

Conservation Concerns

- Unsustainable domestic livestock grazing and timber harvest practices
- Altered natural fire regime
- Invasive or exotic plant species
- Fragmentation and loss of native habitat as a result of conversion to cropland and human population growth/development

Conservation Strategies

- Government and private conservation programs/activities that encourage and support private land stewardship
- Encourage the conservation of natural rangeland communities
- Increased efforts to maintain ecological features (i.e. black-tailed prairie dog colonies) or processes (i.e. fire) on public lands
- Cooperative efforts to reduce the abundance of invasive or exotic species

2090 **References**

2091

2092 The Nature Conservancy. 1999. Ecoregional Conservation in the Northern Great
2093 Plains Steppe. Northern Great Plains Steppe Ecoregional Planning Team. 76

2094 pgs.

2095

2096

North Tobacco Root Mountains and Foothills (224,989 acres)



Figure 8. Tobacco Root Mountains Focus Area

The rugged peaks of the Tobacco Root Mountains overlook this area with their abundant high mountain lakes providing excellent fishing opportunities. These mountains have seen extensive historical mining activity resulting in numerous roads. The foothills provide important elk and mule deer winter range and are dominated by sagebrush/grassland that has seen conversion from spraying and burning of sagebrush. Along the Jefferson River there are productive cottonwood riparian habitats supporting an abundance of wildlife species including whitetail deer and recently introduced Merriam's turkeys. This valley bottom is home to extensive agricultural production of cattle and alfalfa with little or no grain production.

Landscape Characteristics

This subsection is composed of complex faulted mountains and foothills that formed in gneiss, volcanic, and a variety of sedimentary bedrock. Elevations range from 4,200 to 8,000 feet. Drainage density is high. Mean annual precipitation ranges from 10 to 25 inches, about 35 percent falling as snow. The soil temperature and moisture regimes are frigid (cryic at higher elevations) and aridic ustic. The primary natural disturbance is fire. Land use is predominantly livestock grazing and timber harvest. The breakdown for land stewardship in the North Tobacco Root Mountains and Foothills is as follows:

U.S. Federal Agencies:	32,309 acres
BLM:	17,544 acres
USFS:	14,765 acres
State Agencies:	20,695 acres
Private:	171,985 acres

Associated Habitats

Habitat	Habitat Tier	Percentage of Area
Wetland & Riparian	I	2.11
Agricultural Lands - Dry	III	3.29
Limber Pine	III	3.36
Agricultural Lands - Irrigated	III	3.83
Douglas Fir	II	5.01
Mixed Xeric Forest	III	7.42
Very Low Cover Grasslands	I	8.24
Sagebrush	I	11.88
Low/ Moderate Cover Grasslands	I	50.44

Note: A total of 95.59% of the North Tobacco Root Mountains and Foothills area is represented. 4.41% is made up of a combination of other habitat types.

Associated Species of Greatest Conservation Need

There are a total of 244 terrestrial vertebrate species that are North Tobacco Root Mountains and Foothills Focus Area. All associations can be found within Table 15.

Amphibians: Boreal Toad

Birds: Flammulated Owl and Bald Eagle

Mammals: Townsend's Big-eared Bat, Grizzly Bear, and Lynx

Conservation Concerns

- Habitat loss, degradation and fragmentation especially as a result of population growth/development
- Invasive or exotic plant and animal species
- Unsustainable domestic livestock grazing and timber practices

Conservation Strategies

- Support strategic conservation easements/protection by conservation organizations or public agencies by providing advice and technical assistance
- Promote sustainable land management practices on public lands
- Support state/federal tax incentives which discourage habitat fragmentation
- Participate in partnerships to develop and implement weed control strategies

- 2164 • Improve grazing and timber management to enhance biological diversity
2165 on existing managed/protected areas
- 2166 • Promote and further develop county ordinances that help to manage and
2167 plan for development

2168

2169 **References**

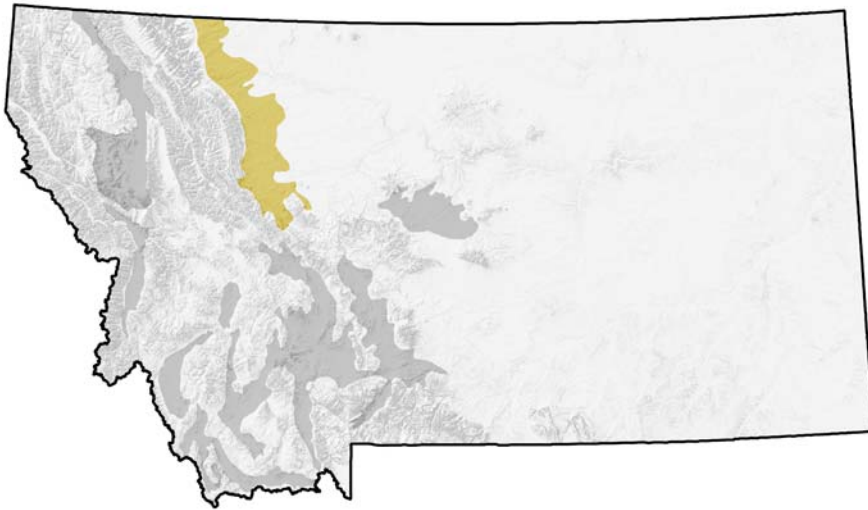
2170

2171 The Nature Conservancy. 2000. Middle Rockies-Blue Mountains Ecoregional
2172 Conservation Plan. Prepared by the Middle Rockies – Blue Mountains Planning
2173 Team. 58 pgs + appendices

2174

2175

2175 **Rocky Mountain Front Foothills (2,018,789 acres)**



2176
2177 **Figure 9. Rocky Mountain Front Foothills Focus Area**

2178
2179 The Rocky Mountain Front, from Alberta, Canada south through Montana, marks
2180 the easternmost edge of the Bob Marshall Wilderness where thrust-faulted
2181 mountains give way to rolling foothills and Great Plains grasslands. This variable
2182 landscape still offers glimpses of grizzly bears moving from high-mountain fir and
2183 spruce forests to native prairie grasslands dotted with pothole marshes where
2184 migrating birds stage season after season. With the exception of bison, all of the
2185 native mammals that inhabited this land when Lewis and Clark passed through
2186 survive here.

2187 **Landscape Characteristics**

2188
2189
2190 This subsection is composed of mountain front foothills, moraines, fans, and
2191 terraces that formed in calcareous shales overlain by till, outwash, alluvium, and
2192 terrace deposits. The landscape has been modified by glaciation. Elevations
2193 range from 3,400 to 8,500 feet. Drainage density is low to moderate. Mean
2194 annual precipitation ranges from 12 to 20 inches, about half falling as snow. The
2195 soil temperature and moisture regimes are frigid and typic ustic. Chinook winds
2196 are frequent. The primary natural disturbance is fire. Land use is predominantly
2197 livestock grazing. The breakdown for land stewardship in the Rocky Mountain
2198 Front Foothills is as follows:

2199

2200 U.S. Federal Agencies:	33,421 acres
2201 BLM:	9,019 acres
2202 USFS:	4,819 acres
2203 USFWS:	1,421 acres
2204 State Agencies:	172,603 acres
2205 Tribal Lands:	482,906 acres
2206 Private:	1,329,427 acres

Associated Habitats

Habitat	Habitat Tier	Percent of Area
Limber Pine	III	2.02
Mixed Broadleaf Forest	I	2.13
Altered Herbaceous	II	3.77
Agricultural Lands - Dry	III	4.41
Agricultural Lands - Irrigated	III	5.96
Mixed Mesic Shrubs	II	6.13
Wetland & Riparian	I	6.47
Moderate/ High Cover Grasslands	I	10.46
Low/ Moderate Cover Grasslands	I	49.69

Note: A total of 91.03% of the Rocky Mountain Front Foothills area is represented. 8.97% is made up of a combination of other habitat types.

Associated Species of Greatest Conservation Need

There are a total of 361 terrestrial vertebrate species that are found within the Rocky Mountain Front Foothills Focus Area. All associations can be found within Table 16.

Amphibians: Boreal Toad and Northern Leopard Frog

Birds: Common Loon, Trumpeter Swan, Harlequin Duck, Bald Eagle, Piping Plover, Mountain Plover, Long-billed Curlew, Black Tern, Flammulated Owl, and Burrowing Owl

Mammals: Townsend's Big-eared Bat, Black-tailed Prairie Dog, Northern Bog Lemming, Grizzly Bear, and Lynx

Reptiles: Western Hognose Snake

Conservation Concerns

- Habitat fragmentation from development as a result of conversion of natural lands to agriculture and human population growth/development
- Energy exploration and development activities
- Invasive or exotic plant or animal species

Conservation Strategies

- Government and private conservation programs/activities that encourage and support private land stewardship
- Policy-based approaches that encourage the conservation of natural communities, rather than support their conversion

- Increased efforts to maintain ecological features (i.e. black-tailed prairie dog colonies) or processes (i.e. fire) on public lands as they disappear from private lands.
- Cooperative efforts to reduce the abundance of invasive or exotic species

References

The Nature Conservancy. 2005. Unpublished Report.

The Nature Conservancy. 1999. Ecoregional Conservation in the Northern Great Plains Steppe. Northern Great Plains Steppe Ecoregional Planning Team. 76 pgs.

United States Fish & Wildlife Service. 2004. Conservation Focus Areas of the Great Divide: A vast region encompassing the Upper Missouri, Yellowstone and Upper Columbia watersheds. Publisher: USFWS, Benton Lake Wildlife Refuge, Great Falls, MT. 77pgs.

South Elkhorn Mountains (171,059 acres)



Figure 10. South Elkhorn Mountains Focus Area

The South Elkhorn Mountains are a diverse landscape with vegetation and topography more typical of Central Montana than the Intermountain Western portion of Montana. Sagebrush Grasslands and broken and rough terrain are found through much of this area although much of the southern portion has been converted to dryland grain and CRP grasslands. Mule deer and antelope are common throughout much of the South Elkhorn Mountains and Sage-grouse were rumored to have been common prior to loss of much of their primary sagebrush habitat. In the northern portion of this area as the mountainous portion of the Elkhorn Mountains are approached, the common geologic formations are limestone ridges and outcrops. These ridges provide the environment for abundant stands of mountain mahogany, which among other things makes this area very attractive mule deer winter range.

Landscape Characteristics

This subsection is composed of mountains and foothills that formed in limestone, dolomite, argillite, andesite, sandstone, and quartzite. Elevations range from 4,500 to 7,500 feet. Drainage density is low. Mean annual precipitation ranges from 12 to 22 inches, about 30 percent falling as snow. The soil temperature and moisture regimes are frigid (cryic at higher elevations) and aridic ustic. The primary natural disturbance is fire. Land use is predominantly livestock grazing and timber harvest. The breakdown for land stewardship in the South Elkhorn Mountains is as follows:

U.S. Federal Agencies:	71,105 acres, which include
BLM:	8,494 acres
USFS:	22,610 acres

2294 State Agencies: 6,425 acres
 2295 Private: 93,529 acres
 2296

2297 Associated Habitats

Habitat	Habitat Tier	Percentage of Area
Lodgepole Pine	III	2.12
Montane Parklands & Subalpine Meadows	III	3.42
Rocky Mountain Juniper	III	7.41
Mixed Xeric Forest	III	7.54
Douglas Fir	II	8.17
Very Low Cover Grasslands	I	13.66
Sagebrush	I	22.13
Low/ Moderate Cover Grasslands	I	28.70

2299
 2300 Note: A total of 93.14% of the South Elkhorn Mountains area is represented. 6.86% is made up of a combination of other
 2301 habitat types.

2302 Associated Species of Greatest Conservation Need

2303 There are a total of 242 terrestrial vertebrate species that are found within the
 2304 South Elkhorn Mountains Focus Area. All associations can be found within Table
 2305 17.
 2306
 2307
 2308

2309 **Amphibians:** Northern Leopard Frog

2310
 2311 **Birds:** Bald Eagle and Black-backed Woodpecker

2312
 2313 **Mammals:** Townsend's Big-eared Bat, Pallid Bat, Gray Wolf, and Lynx
 2314

2315 Conservation Concerns

- 2316
- 2317 • Habitat loss, degradation and fragmentation especially as a result of
- 2318 human population growth
- 2319 • Invasive or exotic plant or animal species
- 2320 • Unsustainable domestic livestock grazing and timber harvest practices
- 2321

2322 Conservation Strategies

- 2323
- 2324 • Support strategic conservation easements/protection by conservation
- 2325 organizations or public agencies by providing advice and technical
- 2326 assistance
- 2327 • Promote sustainable land management practices on public lands
- 2328 • Support state/federal tax incentives which discourage habitat
- 2329 fragmentation

- 2330 • Participate in partnerships to develop and implement weed control
2331 strategies
- 2332 • Improve grazing and timber management to enhance biological diversity
2333 on existing managed/protected areas
- 2334 • Promote and further develop county ordinances that help to plan for and
2335 manage development
- 2336

2337 **References**

2338

2339 The Nature Conservancy. 2000. Middle Rockies-Blue Mountains Ecoregional
2340 Conservation Plan. Prepared by the Middle Rockies – Blue Mountains Planning
2341 Team. 58 pgs + appendices.

2342

2343

Southwest Montana Intermontane Basins and Valleys (2,077,477 acres)



Figure 11. Southwest Montana Intermontane Basins and Valleys Focus Area

The area consists of valleys located between mountain ranges, and typically follows major stream courses. Many small tributary mountain streams flow down the hillsides of these valleys and support wetlands and rivers such as the Red Rock, Madison, Jefferson and Big Hole rivers, and Red Rock Lakes. The vegetation is a mix of sagebrush grassland on the valley floor and, in the wet valley bottoms, riparian species like sedges and willow are common. Coniferous forest and aspen stands in the wetter microsites dominate the higher elevations. The coniferous forest and adjacent sagebrush communities provide winter habitats for mule deer and elk, while the riparian bottoms provide yearlong habitat for white-tailed deer. These intermountain basins and valleys are highly valued for residential development, and are under the imminent threat of habitat fragmentation.

Landscape Characteristics

This subsection consists of intermontane basins and broad valleys that formed in alluvium, glacial deposits, and Tertiary volcanic materials. Elevations range from 4,700 to 7,600 feet. Drainage density is low. Mean annual precipitation ranges from 9 to 20 inches, about 10 percent falling as snow. The soil temperature and moisture regimes are frigid and aridic ustic. Parts of the Red Rock Basin and Big Hole Valley have cryic temperature regimes. The primary natural disturbances are flooding and fire. Land use is predominantly livestock grazing, agriculture, and urban/suburban development. The breakdown for land stewardship in the Southwest Montana Intermontane Basins and Valleys is as follows:

U.S. Federal Agencies:	479,632 acres, which include
BLM:	344,156 acres

USFS: 96,180 acres
 USFWS: 38,610 acres
 NPS: 680 acres
 State Agencies: 275,028 acres
 Private: 1,318,307 acres

Associated Habitats

Habitat	Habitat Tier	Percentage of Area
Very Low Cover Grasslands	I	5.19
Wetland & Riparian	I	6.94
Agricultural Lands - Irrigated	III	9.04
Sagebrush	I	30.19
Low/ Moderate Cover Grasslands	I	31.81

Note: A total of 83.17% of the Southwest Montana Intermontane Basins and Valleys area is represented. 16.83% is made up of a combination of other habitat types.

Associated Species of Greatest Conservation Need

There are a total of 296 terrestrial vertebrate species that are found within the Southwest Montana Intermontane Basins and Valleys Focus Area. All associations can be found within Table 18.

Amphibians: Boreal Toad

Birds: Common Loon, Trumpeter Swan, Bald Eagle, Sage-grouse, Long-billed Curlew, and Flammulated Owl

Mammals: Townsend's Big-eared Bat, Pygmy Rabbit, Great Basin Pocket Mouse, Gray Wolf, Grizzly Bear, and Lynx

Conservation Concerns

- Habitat fragmentation as a result of population growth/development
- Invasive or exotic plant species
- Dewatering as a result of water diversion
- Disruption of natural disturbance processes or hydrologic regimes
- Unsustainable domestic livestock grazing and timber harvest practices
- Altered fire regime

Conservation Strategies

- Support strategic conservation easements/protection by conservation organizations or public agencies by providing advice and technical assistance

- Promote sustainable land management practices on public lands
- Support state/federal tax incentives which discourage habitat fragmentation
- Participate in partnerships to develop and implement weed control strategies, especially strategies which promote plant diversity
- Improve grazing and timber management to enhance biological diversity on existing managed/protected areas, especially discourage practices that degrade riparian areas
- Promote and further develop county ordinances that help to plan for and manage development
- Support conservation easement program and incentives to land owners that protect habitat
- Manage for sustainable use of recreational vehicles on public lands

References

Fargione, Joseph, Brown, Cynthia S., Tilman, David. 2003. Community assembly and invasion: An experimental test of neutral versus niche processes. PNAS. Vol. 100 (15): 8916-8920.

Montana Partners for Fish & Wildlife. 2000. Centennial Valley. 4 pgs. More information at <http://www.r6.fws/gpv/pfw/montana/mt3c.htm>

The Nature Conservancy. 2005. Unpublished Report.

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Upper Yellowstone Valley (178,039 acres)



Figure 12. Upper Yellowstone Valley Focus Area

The Upper Yellowstone Valley, south of Livingston, is better known to many as Paradise Valley. Bracketed by the Absaroka-Beartooth Wilderness on the east and the Gallatin Range on the west, the valley's grassland habitats are bisected by the Yellowstone River and its riparian areas and cottonwood stands. Several streams in the area harbor genetically pure populations of Yellowstone cutthroat trout. Much of the valley lies in the rain shadow of the mountains and is a wintering area for elk, bighorn sheep, and mule deer. The area supports grizzly bears, and there is increasing wolf presence. Cradled within the Gallatin and Absaroka ranges are low-elevation meadows, limited juniper stands mixed with grasslands and sagebrush. Higher up are forests of aspen, pine, spruce, subalpine fir, and whitebark pine.

Landscape Characteristics

This valley is composed of valley floor, terraces, toeslopes, and foothills that formed in alluvium and Tertiary sedimentary and volcanic rocks. Elevations range from 4,500 to 7,500 feet. Drainage density is moderate and wetlands are fairly common. Mean annual precipitation ranges from 15 to 40 inches, about 55 percent falling as snow. The soil temperature and moisture regimes are frigid and aridic ustic. The primary natural disturbance is flooding. Land use is predominantly recreational development, with some agriculture and livestock grazing. The breakdown for land stewardship in the Upper Yellowstone Valley is as follows:

U.S. Federal Agencies:	18,656 acres, which include
BLM:	1,668 acres
USFS:	16,988 acres

2481 State Agencies: 12,293 acres
 2482 Private: 146,101 acres

2483

2484 **Associated Habitats**

2485

Habitat	Habitat Tier	Percentage of Area
Mixed Broadleaf Forest	I	2.14
Mixed Xeric Forest	II	2.28
Moderate/ High Cover Grasslands	I	2.28
Mixed Subalpine Forest	III	3.95
Agricultural Lands - Dry	III	3.98
Wetland & Riparian	I	4.57
Montane Parklands & Subalpine Meadows	III	5.00
Douglas Fir	II	5.17
Sagebrush	I	5.49
Agricultural Lands - Irrigated	III	7.15
Rock	III	7.87
Very Low Cover Grasslands	I	11.16
Low/ Moderate Cover Grasslands	I	28.56

2486

2487

2488

Note: A total of 89.61% of the Upper Yellowstone Valley area is represented. 10.39% is made up of a combination of other habitat types.

2489

2490

Associated Species of Greatest Conservation Need

2491

2492

There are a total of 265 terrestrial vertebrate species that are found within the Upper Yellowstone Valley Focus Area. All associations can be found within Table 19.

2493

2494

2495

2496

Amphibians: Boreal Toad and Northern Leopard Frog

2497

2498

Birds: Trumpeter Swan, Bald Eagle, Long-billed Curlew, and Black-backed Woodpecker

2499

2500

2501

Mammals: Gray Wolf, Grizzly Bear, and Lynx

2502

2503

Conservation Concerns

2504

2505

- Recreational infrastructure development especially road network development

2506

2507

- Sedimentation in streams

2508

- Habitat loss and fragmentation especially as a result of human population growth/development

2509

2510

- Unsustainable timber harvest practices

2511

- Unsustainable irrigation practices

2512

Conservation Strategies

- Support strategic conservation easements/protection by conservation organizations or public agencies by providing advice and technical assistance
- Promote sustainable land management practices on public lands
- Support state/federal tax incentives which discourage habitat fragmentation
- Improve grazing and timber management to enhance biological diversity on existing managed/protected areas
- Promote and further develop county ordinances that help to plan for and manage development

References

A Biological Conservation Assessment for the Utah-Wyoming Rocky Mountain Ecoregion: Report to the Nature Conservancy. 2001. R. Noss, G. Wuerthner, K. Vance-Borland, and C. Carroll. Conservation Science, Inc. 125 pp. + Executive Summary and Appendix D.

Aquatic Conservation Focus Areas in Greatest Need (Tier I)

Big Hole River (153 River Miles)

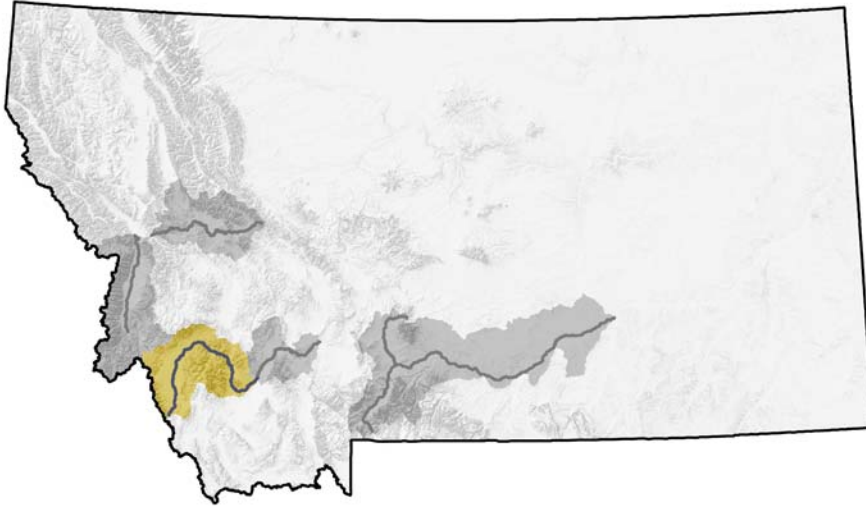


Figure 13. Big Hole River Focus Area

Originally named the Wisdom River by Meriwether Lewis, the Big Hole River and its tributaries start along the boarder of Montana and Idaho. Surrounded by hay meadows, the upper Big Hole separates the Bitterroot Range on the west from the Pioneer Mountains to the east. The middle section of the river runs through a length of gorge and then glides out through hay meadows, once again, where it teams up with the Beaverhead River to create the Jefferson.

Associated Habitats

Habitat Type	Habitat Tier	Acres	Miles
Intermountain Valley Rivers	II		153
Intermountain Valley Streams	II		967
Lowland Lakes	III	297	
Lowland Reservoirs	III	64	
Mountain Lakes	III	2886	
Mountain Reservoirs	III	12	
Mountain Streams	II		2929

Associated Species of Greatest Conservation Need

There are a total of 20 aquatic species that are found within the Big Hole River Focus Area. All associations can be found within Table 20.

Invertebrates: Western Pearlshell

Fish: Westslope Cutthroat Trout, Lake Trout (native lakes), Arctic Grayling, and Burbot

Conservation Concerns

- Diversion of water for irrigation ditches and livestock watering
- Valley fragmentation for subdivisions
- Noxious weeds
- Removal of woody riparian vegetation
- Culverts, dams, irrigation diversions or other instream barriers that fully or partially impede fish movement and reduce connectivity of habitat
- Modification and degradation of stream channels caused by various construction or land management practices
- Degradation of riparian vegetation caused by various land management practices Such activities de-stabilize streambanks, increase sediment inputs, and reduce shading
- Entrainment of juvenile and adult fishes by irrigation diversion or other water intakes
- Alterations of the quantity or timing of streamflows causing dewatering or unnatural flow fluctuations that diminish the quantity or quality of essential habitats
- Water quality: warm, turbid water (caused by shallow in-stream ponds/reservoirs, removal of overhanging vegetation, exposure of erodible soils due to unsustainable land management practices, irrigation returns, etc.) is a problem for cool/cold water riverine systems and species
- Water chemistry problems can arise due to municipal discharge, irrigation return water, and other sources

Conservation Strategies

- Increased installation of stockwater wells in place of irrigation ditches
- Support management of grazing to maintain habitat in excellent condition
- Pursue conservation easements within the valley
- Removal or modification of barriers in a manner that restores fish passage
- Restoration of stream channels, stream banks and riparian areas to a condition that simulates their natural form and function
- Screening or modification of irrigation diversions or other water intakes in a manner that prevents entrainment of fishes
- Implementation of various water conservation or flow management practices that restore essential habitats and simulate the natural hydrograph

2600 **References**

2601

2602 Montana Partners for Fish & Wildlife. 2000. Big Hole River Watershed. 4 pgs.

2603 More information at <http://www.r6.fws/gpv/pfw/montana/mt3c.htm>

2604

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Bitterroot River (84 River Miles)

Figure 14. Bitterroot River Focus Area

This river originates in the Anaconda-Pintler Wilderness and the Bitterroot Mountains in Montana. As the primary tributaries flow together near Conner, Montana it continues north along Highway 93 for 85 miles where it empties into the Clark Fork River near Missoula. To the west, is the glacial Bitterroot Range, and to the east rises the smoother and drier Sapphire Mountains. Just west of the Bitterroot Range lies the Selway Bitterroot Wilderness that encompasses more than 2.15 million acres. The river is characterized by constantly shifting stream channels among extensive cottonwood and Ponderosa Pine bottomland.

Associated Habitats

Habitat Type	Habitat Tier	Acres	Miles
Intermountain Valley Rivers	II		84
Intermountain Valley Streams	II		325
Lowland Lakes	III	1260	
Mountain Lakes	III	2946	
Mountain Reservoirs	III	27	
Mountain Streams	II		3304

Associated Species of Greatest Conservation Need

There are a total of 22 aquatic species that are found within the Bitterroot River Focus Area. All associations can be found within Table 21.

Invertebrates: Western Pearlshell

Fish: Westslope Cutthroat Trout, and Bull Trout

Conservation Concerns

- Valley fragmentation as a result of human population growth
- Presence of non-native aquatic species
- Water quality problems due to municipal discharge, irrigation return water, and other sources
- Culverts, dams, irrigation diversions or other instream barriers that fully or partially impede fish movement and reduce connectivity of habitat
- Modification and degradation of stream channels caused by various construction or land management practices
- Degradation of riparian vegetation caused by various land management practices. Such activities de-stabilize streambanks, increase sediment inputs, and reduce shading
- Entrainment of juvenile and adult fishes by irrigation diversion or other water intakes
- Alterations of the quantity or timing of streamflows causing dewatering or unnatural flow fluctuations that diminish the quantity or quality of essential habitats

Conservation Strategies

- Pursue conservation easements within the valley
- Removal or modification of barriers in a manner that restores beneficial fish passage
- Restoration of stream channels or stream banks to a condition that simulates their natural form and function
- Modification of riparian management practices such that riparian vegetation is allowed to recover
- Screening or modification of irrigation diversions or other water intakes in a manner that prevents entrainment of fishes
- Implementation of various water conservation or flow management practices that restore essential habitats and simulate the natural hydrograph

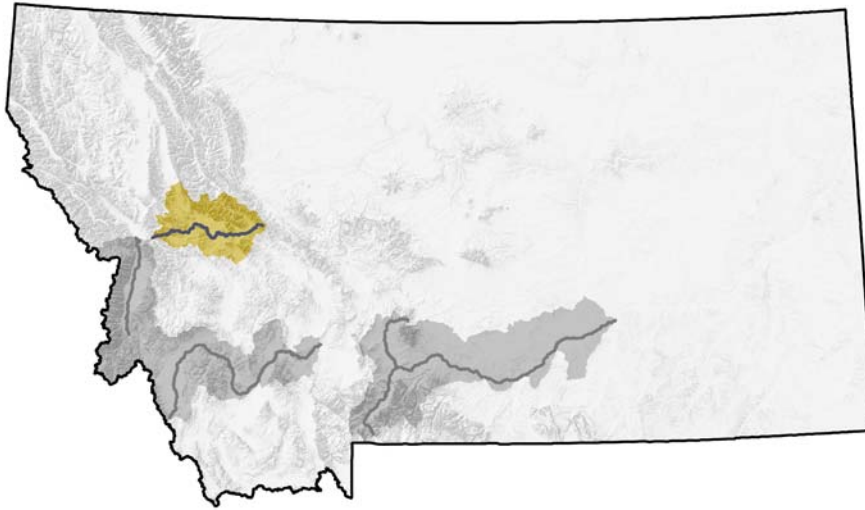
Blackfoot River (127 River Miles)

Figure 15. Blackfoot River Focus Area

The Blackfoot River begins at the junction of Beartrap and Anaconda creeks near the Continental Divide and flows west 132 miles to its mouth at Bonner, Montana. Near its headwaters, the Blackfoot River drops through glaciated high-alpine meadows and runs between steep, forested slopes. Above Lincoln, the river almost annually goes underground, then re-appears below Lincoln and meanders through conifer forests and wetlands until it intersects with the North Fork of the Blackfoot River. For its remaining 52 miles, the Blackfoot levels out, and moves through open ranch and timbered areas, until it meets the Clark Fork River near Bonner. A free flowing river, the Blackfoot is affected by soon to be removed Milltown Dam, which has blocked fish passage on the Clark Fork River since 1907.

Associated Habitats

Habitat Type	Habitat Tier	Acres	Miles
Intermountain Valley Rivers	II		127
Intermountain Valley Streams	II		316
Lowland Lakes	III	6525	
Lowland Reservoirs	III	390	
Mountain Lakes	III	2604	
Mountain Reservoirs	III	5	
Mountain Streams	II		3207

Associated Species of Greatest Conservation Need

There are a total of 25 aquatic species that are found within the Blackfoot River Focus Area. All associations can be found within Table 22.

Invertebrates: Western Pearlshell

Fish: Westslope Cutthroat Trout and Bull Trout

Conservation Concerns

- Culverts, dams, irrigation diversions or other instream barriers that fully or partially impede fish movement and reduce connectivity of habitat
- Modification and degradation of stream channels caused by various construction or land management practices
- Degradation of riparian vegetation caused by various land management practices. Such activities de-stabilize streambanks, increase sediment inputs, and reduce shading
- Entrainment of juvenile and adult fishes by irrigation diversion or other water intakes
- Alterations of the quantity or timing of streamflows causing dewatering or unnatural flow fluctuations that diminish the quantity or quality of essential habitats
- Unnatural hydrograph and water temperatures associated with presence and operations of large dams, as well as blockage of migratory corridors
- Water quality: warm, turbid water (caused by shallow in-stream ponds/reservoirs, removal of overhanging vegetation, exposure of erodable soils due to unsustainable land management practices, irrigation returns, etc.) is a problem for cool/cold water riverine systems and species
- Water chemistry problems that arise due to contamination by hard rock mines in headwaters, irrigation return water, and other sources

Conservation Strategies

- Removal or modification of barriers in a manner that restores fish passage for fluvial native fish
- Implementation of a comprehensive mine cleanup in the headwaters of the Blackfoot River upstream of Lincoln, Montana
- Restoration of stream channels or stream banks to a condition that simulates their natural form and function
- Modification of riparian management practices such that riparian vegetation is allowed to recover
- Screening or modification of irrigation diversions or other water intakes in a manner that prevents entrainment of fishes
- Implementation of various water conservation or flow management practices that restore essential habitats and simulate the natural hydrograph

- Work to the extent feasible, to operate dams to mimic a more natural hydrograph in the primary system rivers, and ensure more natural thermal regime. Provide passage over dams to ensure full migratory movement

References

Jefferson River (77 River Miles)



Figure 16. Jefferson River Focus Area

Lewis and Clark named this river after President Thomas Jefferson because it carried the greatest volume of water at that time compared to the near by Madison and Gallatin rivers. The Jefferson River begins where the Big Hole and Beaverhead intersect and flows north through cattle country, limestone cliffs, and into the cottonwood bottoms near Three Forks, where it meets the Madison and Gallatin rivers to form the Missouri River.

Associated Habitats

Habitat Type	Habitat Tier	Acres	Miles
Intermountain Valley Rivers	II		77
Intermountain Valley Streams	II		1377
Lowland Lakes	III	214	
Lowland Reservoirs	III	715	
Mountain Lakes	III	627	
Mountain Reservoirs	III	609	
Mountain Streams	II		1091

Associated Species of Greatest Conservation Need

There are a total of 22 aquatic species that are found within the Jefferson River Focus Area. All associations can be found within Table 23.

Invertebrates: Western Pearshell

Fish: Westslope Cutthroat Trout, Arctic Grayling, and Burbot

Conservation Concerns

- Culverts, dams, irrigation diversions or other instream barriers that fully or partially impede fish movement and reduce habitat connectivity
- Modification and degradation of stream channels caused by various construction or land management practices
- Degradation of riparian vegetation caused by various land management practices. Such activities de-stabilize streambanks, increase sediment inputs, and reduce shading
- Entrainment of juvenile and adult fishes by irrigation diversion or other water intakes
- Alterations of the quantity or timing of streamflows causing dewatering or unnatural flow fluctuations that diminish the quantity or quality of essential habitats
- Warm, turbid water (caused by shallow in-stream ponds/reservoirs, removal of overhanging vegetation, exposure of erodible soils due to poor land management practices, irrigation returns, etc.) are a problem for cool/cold water riverine systems and species
- Water chemistry problems can arise due to municipal discharge, irrigation return water, and other sources

Conservation Strategies

- Removal or modification of barriers in a manner that restores fish passage
- Restoration of stream channels or stream banks to a condition that simulates their natural form and function
- Modification of riparian management practices such that riparian vegetation is allowed to recover
- Screening or modification of irrigation diversions or other water intakes in a manner that prevents entrainment of fishes
- Implementation of various water conservation or flow management practices that restore essential habitats and simulate the natural hydrograph

References

- DNRC 2005. Canal Seepage Monitoring in the Upper Jefferson River Basin.
- Land and Water Consulting, Inc. 2003. Jefferson River Water Quality Restoration Planning Areas. Watershed Characterization Report.
- Land and Water Consulting, Inc. 2003. Jefferson River Water Quality Restoration Planning Areas. Water Quality Status Report.

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2806 Land and Water Consulting, Inc. 2004. Aerial Photo Review and Field Source
2807 Assessment – 2004.
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2809 McGuire, Daniel 2004. Jefferson River Aquatic Macroinvertebrate Survey.
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2811 Montana Fish, Wildlife & Parks. 2004. Jefferson River Fisheries Information
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Upper Yellowstone River (272 River Miles)

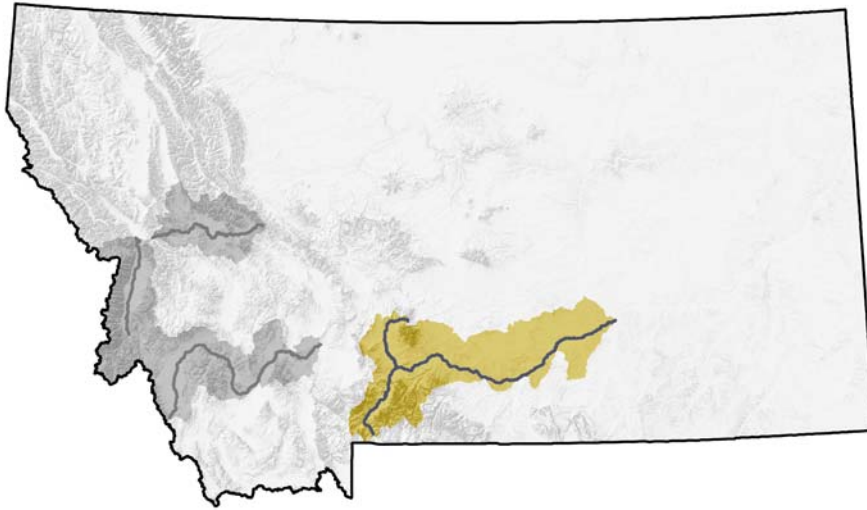


Figure 17. Upper Yellowstone River Focus Area

The Yellowstone River originates in Wyoming and flows through Yellowstone National Park before entering Montana near Gardiner. From the park boundary to Livingston, the river flows north through the Gardiner Basin and eventually enters Paradise Valley, flanked by the Absarokee Mountains on the east and the Gallatin Range on the west. The river continues in a northeasterly direction from Livingston and meets up with the Missouri River just across the North Dakota border. The river has survived as one of the last, large, free flowing rivers in the continental United States. Lack of impoundments allows spring peak flows and fall and winter low flows to influence a unique and dynamic community. The Upper Yellowstone River supports clear, coldwater cutthroat trout fisheries in Yellowstone National Park to the warm-water habitats on the plains. The adjacent environments include cottonwood-willow bottomlands and broad low cover grasslands.

Associated Habitats

Habitat Type	Habitat Tier	Acres	Miles
Lowland Lakes	III	10838	
Lowland Reservoirs	III	580	
Mixed Source Rivers (Intermountain and Prairie Flow)	II		259
Prairie Streams	I		5378
Intermountain Valley Rivers	II		131
Intermountain Valley Streams	II		1068
Mountain Reservoirs	III	1	

Mountain Lakes	III	1893	
Mountain Streams	I		2834

Associated Species of Greatest Conservation Need

There are a total of 46 aquatic species that are found within the Upper Yellowstone and Tributaries Focus Area. All associations can be found within Table 24.

Fish: Yellowstone Cutthroat Trout, Burbot, and Sauger

Conservation Concerns

- Culverts, dams, irrigation diversions or other instream barriers that fully or partially impede fish movement and reduce connectivity of habitat
- Modification and degradation of stream channels caused by various construction or land management practices
- Degradation of riparian vegetation caused by various land management practices including human development. Such activities de-stabilize streambanks, increase sediment inputs, and reduce shading
- Entrainment of juvenile and adult fishes by irrigation diversion or other water intakes
- Alterations of the quantity or timing of streamflows causing dewatering or unnatural flow fluctuations that diminish the quantity or quality of essential habitats
- Water quality: warm, turbid water (caused by shallow in-stream ponds/reservoirs, removal of overhanging vegetation, exposure of erodible soils due to unsustainable land management practices, irrigation returns, etc.) is a problem for cool/cold water riverine systems and species
- Water chemistry problems that arise due to municipal discharge, irrigation return water, the discharge of waste water from coal bed methane operations, and other sources
- Dewatering as a result of water diversion
- Rip-rap and other bank stabilization work
- Invasive non-native fish species
- Disruption of natural disturbance processes or hydrologic regimes

Conservation Strategies

- Removal or modification of barriers in a manner that restores fish passage
- Restoration of stream channels or stream banks to a condition that simulates their natural form and function
- Modification of riparian management practices such that riparian vegetation is allowed to recover

- Screening or modification of irrigation diversions or other water intakes in a manner that prevents entrainment of fishes
- Implementation of various water conservation or flow management practices that restore essential habitats and simulate the natural hydrograph
- Restore and maintain flood dynamics and natural hydrologic regimes

References

Hansen, A., Rotella, J., Klass, L., Gyskiewicz, D. 2003. Riparian habitat Dynamics and wildlife along the Upper Yellowstone River. Technical Report #1. Landscape Biodiversity Lab, Montana State University, Bozeman, MT. In cooperation with The Governor's Upper Yellowstone River Task Force.

United States Fish & Wildlife Service. 2004. Conservation Focus Areas of the Great Divide: A vast region encompassing the Upper Missouri, Yellowstone and Upper Columbia watersheds. Publisher: USFWS, Benton Lake Wildlife Refuge, Great Falls, MT. 77pgs.

Montane Forest Ecotype



Figure 18. Montane Forest Ecotype

Montana's montane forests occur along the western third of the state from the rugged peaks of the Purcell Mountains in northwestern Montana to the Beartooth Range near Yellowstone National Park. From the foothills to their summits, vast coniferous forests of larch, fir, hemlock, pine, and spruce trees characterize these areas. Such mountain forests also serve to protect the headwaters of Montana's rivers. Most of this ecotype is in public ownership through the U.S. Forest Service. Collaboration with the USFS will be critical to the conservation of these areas.

Landscape Characteristics

The montane forest ecotype includes 24,498,117 acres and represents 26 % of the Montana. This ecotype is mostly situated on mountain slopes although a small portion is located in valleys of extreme northwest Montana. Slopes are generally moderate to steep, often exceeding 45°. All mountain ranges in Montana have at least some montane forest as well as the following major valley locations: lower Clark Fork, upper Flathead, Seeley/Swan, Kootenai, Bull River/Lake Creek, and the Stillwater north of Whitefish. These are all included in this ecotype.

The elevation range is the same as for the entire state (the highest and lowest elevation points in Montana are in this ecotype). The lowest elevation, 1,800 feet, occurs where the Kootenai River flows into Idaho. The highest elevation is 12,799 feet atop Granite Peak in the Beartooth Mountains. Both base elevations and mountaintop elevations are lowest in the northwest section of the ecotype, increasing toward the south. Base elevations of near 2,000 feet in the Libby, Troy, and Thompson Falls area increase to about 3,000 feet in the

Flathead/Mission valleys and increase further to over 3,000 feet in the Missoula/Bitterroot valleys. The highest base elevations west of the divide are generally about 4,500 feet along the east front and south as far as the upper Jefferson valley. As the divide is approached from here, base elevations exceed 6,000 feet in the Big Hole and Centennial valleys. Generally, base elevations inside and outside of the mountain front as well as around the Little Belt, Big Snowy, Judith, and Crazy Mountains are around 4,000 to 4,500 feet. Base elevations around the Highwood, Bear Paw, and Little Rocky mountains are about 3,000 to 3,500 feet.

Although summit elevations of mountains in the north are lower than those in the south (i.e., major mountain ranges in the north topping out at 9,000 to 10,000 feet versus 10,500 to 12,800 feet in the south), base to summit relief is similar. High mountain ranges in all areas are 6,000 to 7,000 feet from base to summit and moderate mountain ranges 4,000 to 5,000 feet. Distances between mountain ranges are shorter in the north, particularly, and west of the divide generally, than those in the southwest.

Since the end of the Precambrian age (600 million years ago), there have been two episodes in the region now occupied by the northern Rockies. The first was a compression stage, resulting in folding and overthrusting of rock strata. Following this has been a tension stage, where the region is pulled apart, causing rock segments to pull apart and tip at various angles. This stage is currently active. During the Precambrian age, sediments were deposited over a wide area in a sea extending from the Three Forks area north into Canada. These sediments form the belt series rocks found in the mountains of most of northwestern Montana. Most of the mountains in the southwest comprise combinations of metamorphic, igneous and Paleozoic/Mesozoic (deposited after 600 million years ago) rocks. Individual mountain ranges often have a core or central area of metamorphic or intrusive igneous rock partially surrounded by uplifted layers of sedimentary rocks. Some mountain areas such as the Gallatin Range, mountains around Wolf Creek, and the Bearpaw mountains consist of extrusive igneous (lava flows). Two very large areas of intrusive igneous rock (granite) occur between Helena and Twin Bridges and the other south from Hamilton toward Anaconda. The topography of most of the higher mountain ranges has been influenced by glaciation. Mountain glaciers have created features including glacial troughs (U-shaped valleys), cirques, tarns (lakes in cirques), and sharp horns and walls. The mountains in the northwest corner were overridden by the Cordilleran Ice Sheet that tended to smooth off their tops. The northern end of the Mission Range is an example of this, whereas the southern end of this range is a prime example of mountain glaciation. Except for the Crazies and the Little Belts, the isolated mountain groups of central Montana did not experience mountain glaciation but may have partially overridden by the Laurentide Ice Sheet. Most of the mountain region has had anywhere from 10 to 45 centimeters of volcanic ash deposited on it. The heaviest deposits were in the

extreme northwest. These deposits occurred during the time of the formation of the Cascade Mountains.

Soils

Most of the montane forest ecotype is overlain by soils that are classified as cool or cold (32° to 47° F), cool rather than cold in the summer, and moist most of the time (termed udic). Such soils generally form under forest cover and have an organic duff layer (partially decomposed leaves, etc.) underlain by either a white leached layer or a brown clay layer. If the parent material is limestone, a calcareous layer may be present. Except for the limestone-derived soils, they are usually acid.

Climate

Most of the climate discussion is based on information in Caprio and Nielsen 1992. The climate of the montane forest ecotype is ruled by first macroclimatic influences and then by elevation influences. The general climate of the northwest mountain areas is maritime while that of the mountains farther east and south is more continental although mountain areas in general tend to be more maritime than their adjacent lowlands. Elevation affects both temperature and precipitation. A general rule of thumb is that temperature decreases about 6° F for every 1,000 feet rise in elevation. This is a general rule and might not hold true in specific areas. Because of orographic affects, precipitation increases with increasing elevation, so that in any specific area the higher elevations are wetter. However, due to macroclimatic differences, a given elevation in one part of the state will not receive the same amount of precipitation as another. The pattern of yearly distribution will also be different.

Mean yearly temperatures range from 39° to 40° F. at lower elevations in most of the mountains to about 30° F. at the highest elevations. The Beartooth Mountains and plateau constitute a large and very high landmass with annual average temperatures as low as 20° F. Throughout most of the mountain mass, January maximum daily temperatures are in the 22° to 25° F. range, however at high elevations of mountains in southwestern and central Montana and Glacier Park these temperatures range from 8° to 19° F. Some of the areas of northwestern Montana are warmer, with January maximum daily temperatures from 28° to 30° F. A similar pattern holds true for mean January nighttime minimums except the relative greater warmth of the northwestern mountains is more extreme. The mountains of almost the entire northwest corner exhibit January minimum temperatures in the 10° to 11° F. range no matter what elevation. The mountains of the rest of Montana have January mean minimum temperatures ranging from 4° to 6° F. at lower elevations and 0° to -11° F. at highest elevations. The mean July daily temperatures at low elevations generally range from 58° to 60° F. while at high elevations they range from 51° to 54° F. The coldest places are the Beartooth Plateau and the mountains of Glacier Park.

Those mountains bordering or surrounded by the plains have the lowest mean annual extreme minimum temperatures. The two coldest mountain ranges in this regard, the Beartooths and Crazy's, experience annual minimum temperatures in the -41° to -45° F. range. At the other extreme, the mountains of the northwest corner do not generally get colder than -27° F. at any elevation. Annual maximums range from 85° to 92° F. throughout most of the mountains. The frost-free season at most of the higher elevations ranges from 10 to 50 days annually. Obviously frost can occur at any date. Lower elevations have seasons ranging from 50 to 90 days annually.

The montane forest ecotype is the wettest in the state. Closed canopy forests generally do not occur at less than 20 inches annual precipitation in western Montana. Within the ecotype the northwest is the wettest. A given precipitation level is reached at a much lower elevation in the northwest than in the south and east, in other words, it takes a lot more elevation to produce the same amount of precipitation in the southwest, southcentral and central mountains than it does in the northwest. In the southwest, only a few very small and scattered areas receive more than 60 inches annually. These occur at elevations greater than 11,000 feet in the Beartooth, Crazy, and Madison mountains. In the northwest, such areas are relatively large and occur in most mountain areas higher than 7,000 feet. Higher parts of Glacier Park, Cabinet Mountains, the Mission Range, and the Swan Range are estimated to receive over 120 inches annually.

Average annual precipitation for the ecotype as a whole is estimated to be around 37 inches. Some relatively small areas of the ecotype are in the 12 to 16 inch zone. 52% of the area in the ecotype receives 20 to 40 inches while the remainder receives 40 to 60 inches (20%), 16 to 20 inches (15%), 60 to 100 inches (9%), 12 to 16 inches (3%), and 100 or more inches (1%). Yearly precipitation in the mountain areas is more maritime (more precipitation in winter than summer) than adjacent low lands. What actually might be the case is that precipitation is much higher in the mountains than other areas during winter, whereas in summer there is relatively little difference, suggesting that a major reason for the relative dryness of the low elevation areas is lack of moisture in the winter. This effect is most extreme in the northwest corner, where the relatively higher winter precipitation extends even into low elevations. The lowest percentage of growing season precipitation in the state, 22 to 27 percent, occurs in a wide area around the Cabinet Mountains and in small areas in Glacier Park and the Mission Range. Summer precipitation in the high southwestern mountains generally ranges from 32 to 35% of the total annual precipitation.

Snowfall ranges from 81 to 300 inches annually in most mountain areas depending on elevation although parts of the Mission Range, the Swan Range and Glacier Park may get 1,000 inches in an average year. In most mountain areas, the ground will be covered with at least 1 inch of snow from 120 to 260 days in an average year. A large part of the Glacier Park may have snow on the ground for over 300 days.

Anthropogenic

The montane forest ecotype is diverse both in land management and its uses by humans. Whether it is for natural resources or recreational activities, these areas have multiple opportunities for explorers and entrepreneurs. Primary activities include hiking, mountaineering, hunting, biking, snowmobiling, animal watching, and skiing. The primary industries in this ecotype are construction and the timber industry. The breakdown of landowner stewardship for montane forest ecotype is as follows:

U.S. Federal Agencies:	17,405,054 acres, which include
BLM:	648,466 acres
USFS:	15,586,235 acres
USFWS:	19,707 acres
NPS:	1,125,565 acres
State Agencies:	765,594 acres
Tribal Lands:	825,579 acres
Private:	5,231,777 acres
City & County:	6,795 acres

Vegetation

Vegetation community composition in the forested mountain areas of Montana is not affected by soil conditions except under a few conditions (Pfister et al. 1977). Forest vegetation patterns are influenced primarily by climate, topography, and species migrations patterns. The factors mentioned above result in a great variation in forest species composition across the ecotype. Because of this, the vegetation of this ecotype will be described in general areas based on climate characteristics. The northwest area north of Missoula and west of the Continental Divide has the greatest variety of tree species. The macroclimate of the northwest forest is more maritime, generally resulting in an area less subject to cold arctic outbreaks in the winter, receiving more total precipitation, and a higher proportion of precipitation in the winter. The climatic conditions create an area where potentially 100% of the land could be forested. Most valleys are forested, and except for the non-forested Flathead Basin, these are included in the Montane forest ecotype. Climate, plus a greater proximity to the Pacific, results in a greater abundance of Pacific and Intermountain flora, and a greater variety of plant species than the remainder of Montana. Grand fir (*Abies grandis*), western hemlock (*Tsuga heterophylla*), arborvitae or western red cedar (*Thuja plicata*), mountain hemlock (*Tsuga mertensiana*) and western white pine (*Pinus monticola*) are trees essentially confined to the northwest forested area. Western hemlock and white pine are limited primarily due to the extreme northwest corner. Alpine larch (*Larix lyallii*) extends a very short distance into the northern most part of the east-of-divide area and western larch penetrates much of the westcentral region (Arno 1979). As in other parts of Montana, individual

tree species are adapted to certain elevation zones. The order of adaptation from lowest to highest elevation, for trees in the northwest area has been determined by (Pfister et al. 1977). In those areas warm and dry enough such that there is a lower timberline adjacent to grassland, ponderosa pine (*Pinus ponderosa*) dominates at the lowest forest elevations. The upper timberline at about 8,000 feet is formed by alpine larch, whitebark pine, and subalpine fir. Grand fir, arborvitae or western red cedar, both hemlocks, and alpine larch have very narrow zones of distribution. The other conifer species may occupy elevation zones thousands of feet wide and therefore occur together with numerous other species. Generally the tree species are considered climax dominants only in the lower part of their range and are seral in upper parts, however in the northwest area, western larch, lodgepole pine, and spruce are considered seral wherever they occur (Pfister et al. 1977).

Some of the understory species common in the northwest area of the montane forest ecotype are either absent or rare in other parts of the ecotype. These include devil's club (*Oplopanax horridum*), queencup beadle (*Disporum hookeri*), trefoil foamflower (*Tiarella trifoliata*), and wild sarsaparilla (*Aralia nudicaulis*). Heartleaf arnica (*Arnica cordifolia*), common juniper (*Juniperus communis*), and elk sedge (*Carex geyeri*) are rare in the northwest area but are widespread in other areas of the ecotype (Arno 1979). Understory species ubiquitous and relatively common in the northwest and throughout the montane forest ecotype include: bluebunch wheatgrass, Idaho fescue, rough fescue, snowberry (*Symphoricarpos albus*), spirea (*Spirea betulifolia*), pinegrass (*Calamagrostis rubescens*), ninebark (*Physocarpus malvaceus*), twinflower (*Linnaea borealis*), huckleberry (*Vaccinium spp.*), and kinnikinnik (*Arctostaphylos uva-ursi*).

In the westcentral area of the montane forest ecotype the climate is drier, colder, and less maritime than the northwest, but is less continental than parts of the ecotype to the east and south. Western larch is common (although not necessarily widespread) in westcentral and northwest areas but not throughout the ecotype. Arborvitae or western red cedar, grand fir, and alpine larch penetrate slightly into this area. The elevation ordering of tree species is similar to the northwest area except that grand fir, arborvitae or western red cedar, white pine, and hemlock are missing in most areas. Understory species shared with the northwest area but uncommon or missing to the east and south include: smooth woodrush (*Luzula hitchcockii*), menziesia (*Menziesia ferruginia*), and beargrass (*Xerophyllum tenax*).

In areas east of the continental divide, the ecotype is reduced to relatively isolated mountain islands surrounded by grassland or shrub/grassland. Compared to the northwest and west central areas, the overall climate in the east is colder, drier, and windier. This results in conditions unsuitable for several of the tree species found to the north and west. Although ponderosa pine is present in the plains forests to the east (Plains forest ecotype), it is generally absent throughout all but a small portion of this area of the montane forest

ecotype. Apparently, the growing seasons coupled with high elevations limit the distribution of ponderosa pine. The most extensive areas of ponderosa pine just east of the divide are around Helena (Arno 1979). Douglas fir, lodgepole pine, and subalpine fir dominate forests throughout this area. Lodgepole pine is an extremely common seral species dominating much of the upper Douglas fir zone and the spruce fir zone. Only a very restricted area close to Yellowstone Park is apparently climax lodgepole pine. Areas near the timberline commonly support subalpine fir and whitebark pine except on limestone substrates where whitebark pine is generally missing and is often replaced by limber pine (*Pinus flexilis*). Alpine larch penetrates a small distance into the northern most reaches of this area where adjacent to the northwest area. Extensive amounts of the southcentral area of the ecotype support spruce dominated forests.

Terrestrial Conservation Focus Areas in Greatest Need (Tier I)

Mission/Swan Valley and Mountains (679,663 acres)



Figure 19. Mission/Swan Valley and Mountains Focus Area

This area is geologically similar to Glacier National Park, with the Swan Valley sandwiched in between the heavily glaciated ranges of the Mission and Swan Mountains. The mountain ranges and a strong Pacific storm track produce an inland maritime climate over a topography ranging from alpine ridges, cirque headwalls, and cirque basins down to moraines, terraces, and creek and river bottoms. The area is heavily forested with relatively fertile soils with most having a 6-12 inch thick layer of volcanic ash immediately below the organic matter, a souvenir from eruptions in the Cascade Range. The valley bottom, in addition to the riparian areas along streams and rivers, is comprised of a wide array of wetlands such as fens/peatlands, marshes, vernal pools, ponds, and lakes with the valley bottom area being comprised of >15% wetlands (compared to the Montana average of <2% wetland area). The area currently provides critical habitat for wildlife such as grizzly bear, lynx, bull trout, bald and golden eagle, peregrine falcon, common loon, northern goshawk, and wolverine. More common wildlife species include whitetail and mule deer, elk, mountain goat, moose, black bear, mountain lion, bobcat, beaver, along with a host of other mammals, fish, waterfowl, raptors, and songbirds. The valley contains one of the highest concentrations of rare plant populations in the region with most of them being associated with the wetland habitats such as water howellia.

Landscape Characteristics

This area is a large intermontane valley with adjacent block faulted mountains that formed in valley fill, till and metasedimentary rock. Volcanic ash influences most soils. Alpine glaciation has strongly shaped the landscape. Elevations

range from 2,900 to 9,300 feet. Drainage density is moderate. Wetlands and lakes occur frequently in this subsection. Mean annual precipitation ranges from 20 to 110 inches, about 80 percent falling as snow in the mountains. The soil temperature and moisture regimes are cryic and udic. The primary natural disturbances are fire, insects, and windthrow. Land use is predominantly for resource management and outdoor recreation with rural and suburban development in the valleys. The breakdown for land stewardship in the Mission/Swan Valley and Mountains is as follows:

U.S. Federal Agencies:	375,477 acres, which include
USFS:	373,870 acres
USFWS:	1,606 acres
State Agencies:	45,344 acres
Tribal Lands:	99,089 acres
Private:	159,136 acres

Associated Habitats

Habitat	Habitat Tier	Percentage of Area
Snowfields Or Ice	II	2.09
Douglas-fir/ Lodgepole Pine	III	2.36
Western Larch	III	2.55
Montane Parklands & Subalpine Meadows	III	4.16
Rock	III	4.38
Mixed Mesic Shrubs	II	5.21
Douglas Fir	II	10.12
Lodgepole Pine	III	10.61
Mixed Subalpine Forest	III	14.57
Mixed Mesic Forest	II	31.64

Note: A total of 87.68% of the Mission/Swan Valley and Mountains area is represented. 12.32% is made up of a combination of other habitat types.

Associated Species of Greatest Conservation Needs

There are a total of 246 terrestrial vertebrate species that are found within the Mission/Swan Valley and Mountains Focus Area. All associations can be found within Table 25.

Amphibians: Boreal Toad

Birds: Common Loon, Trumpeter Swan, Harlequin Duck, Bald Eagle, Flammulated Owl, Black-backed Woodpecker, and Olive-sided Flycatcher

Mammals: Townsend's Big-eared Bat, Hoary Marmot, Northern Bog Lemming, Gray Wolf, Grizzly Bear, and Lynx

Conservation Concerns

- Habitat fragmentation especially as a result of human population growth/development
- Wetland and riparian habitat degradation
- Invasive or exotic plant species
- Water quality degradation
- Altered fire regimes

Conservation Strategies

- Collaborate with existing conservation efforts in the area
- Conservation of private lands in the valley, including corporate timber lands

References

The Nature Conservancy. 2004. Canadian Rocky Mountains Ecoregional Assessment. Four volumes, including Report, Appendices, Conservation Area Descriptions & Maps.

United States Fish & Wildlife Service. 2004. Conservation Focus Areas of the Great Divide: A vast region encompassing the Upper Missouri, Yellowstone and Upper Columbia watersheds. Publisher: USFWS, Benton Lake Wildlife Refuge, Great Falls, MT. 77pgs.

Aquatic Conservation Focus Areas in Greatest Need (Tier I)

Lower Clark Fork (149 River Miles)



Figure 20. Lower Clark Fork River Focus Area

The lower Clark Fork River originates at the confluence of the Clark Fork River and the Flathead River near the town of Paradise and continues to the Idaho Border. The lower Clark Fork River is bordered on the south by the Bitterroot Mountains and on the north by the Cabinet Mountains. Where the Lower Clark Fork River leaves Montana, it is the largest river in Montana based on mean annual discharge. Average annual precipitation in the Lower Clark Fork drainage is quite high in comparison to other portions of Montana due to a significant maritime influence. Relatively wet and warm winter conditions commonly lead to rain-on-snow events that significantly affect the hydrology of tributaries to the lower Clark Fork River by increasing the frequency of high flow. The primary system Clark Fork River has been substantially altered by the construction of the Thompson Falls, Noxon Rapids, and Cabinet Gorge hydroelectric projects. These dams currently impound approximately 63 miles of river within Montana.

Associated Habitats

Habitat Type	Habitat Tier	Acres	Miles
Intermountain Valley Rivers	II		149
Lowland Lakes	III	812	
Lowland Reservoirs	III	11637	
Mountain Lakes	III	3607	
Mountain Streams	I		2053

Associated Species of Greatest Conservation Need

There are a total of 30 aquatic species that are found within the Lower Clark Fork Focus Area. All associations can be found within Table 26.

Fish: Westslope Cutthroat Trout, and Bull Trout

Conservation Concerns

- Culverts, dams, irrigation diversions or other instream barriers that fully or partially impede fish movement and reduce connectivity of habitat
- Modification and degradation of stream channels caused by various construction or land management practices
- Degradation of riparian vegetation caused by various land management practices. Such activities de-stabilize streambanks, increase sediment inputs, and reduce shading
- Entrainment of juvenile and adult fishes by irrigation diversion or other water intakes
- Alterations of the quantity or timing of streamflows causing dewatering or unnatural flow fluctuations that diminish the quantity or quality of essential habitats
- Unnatural hydrograph and water temperatures associated with presence and operations of large dams, as well as blockage of migratory corridors
- Water quality: warm, turbid water (caused by shallow in-stream ponds/reservoirs, removal of overhanging vegetation, exposure of erodible soils due to unsustainable land management practices, irrigation returns, etc.) is a problem for cool/cold water riverine systems and species
- Water chemistry problems can arise due to municipal discharge, irrigation return water, and other sources
- Improper timber harvesting techniques
- Altered fire regimes
- Non-native fish species
- Mis-identification of fish species by anglers

Conservation Strategies

- Removal or modification of barriers in a manner that restores fish passage
- Restoration of stream channels or stream banks to a condition that simulates their natural form and function
- Modification of riparian management practices such that riparian vegetation is allowed to recover
- Screening or modification of irrigation diversions or other water intakes in a manner that prevents entrainment of fishes

- 3332 • Implementation of various water conservation or flow management
- 3333 practices that restore essential habitats and simulate the natural
- 3334 hydrograph
- 3335 • Provide passage over dams to ensure full migratory movement
- 3336 • Conservation easements
- 3337 • Angler education on fish species identification
- 3338

3339 **References**

3340

3341 The Nature Conservancy. 2004. Canadian Rocky Mountains Ecoregional

3342 Assessment. Four volumes including Report, Appendices, Conservation Area

3343 Descriptions & Maps.

3344

3345

Middle Clark Fork (119 River Miles)



Figure 21. Middle Clark Fork Focus Area

The Middle Clark Fork River extends about 115 river miles from Milltown Dam in Bonner, Montana to its confluence with the Flathead River and is entirely free flowing. The milltown dam is scheduled to be removed in the near future. Its drainage is mountainous and covered with the large forested tracts of the Lolo National Forest and private timberlands, broken by grazing and cropland areas in the lower valleys down to the Thompson Falls Dam. Through the broad Missoula Valley, the middle Clark Fork is a sinuous river with frequent side channels, wide floodplains and cottonwood-willow bottoms. The river then transitions into the Alberton Gorge whitewater area and becomes an entrenched single channel as it proceeds toward Thompson Falls. Major tributary systems such as Rattlesnake Creek and Fish Creek drain premier roadless wildlands including the Rattlesnake Wilderness and proposed Great Burn Wilderness along the Montana-Idaho divide. This river supports an excellent coldwater trout fishery including fluvial populations of native westslope cutthroat trout and bull trout. Because the middle Clark Fork receives the waters of the Blackfoot, Bitterroot and upper Clark Fork basins, it is known as a steady and productive system that supports a consistent fishery.

Associated Habitats

Habitat Type	Habitat Tier	Acres	Miles
Intermountain Valley Rivers	II		119
Intermountain Valley Streams	II		113
Lowland Lakes	III	546	
Lowland Reservoirs	III	9	

Mountain Lakes	III	1168	
Mountain Streams	I		2080

Associated Species of Greatest Conservation Need

There are a total of 22 aquatic species that are found within the Middle Clark Fork Focus Area. All associations can be found within Table 27.

Fish: Westslope Cutthroat Trout, and Bull Trout

Conservation Concerns

- Residential development impacts that destabilize riparian areas
- Rip-rap and other bank stabilization work
- Invasive non-native fish species
- Whirling disease
- Disruption of natural disturbance processes or hydrologic regimes
- Culverts, dams, irrigation diversions or other instream barriers that fully or partially impede fish movement and reduce connectivity of habitat
- Modification and degradation of stream channels caused by various construction or land management practices
- Degradation of riparian vegetation caused by various land management practices. Such activities de-stabilize streambanks, increase sediment inputs, and reduce shading
- Entrainment of juvenile and adult fishes by irrigation diversion or other water intakes
- Alterations of the quantity or timing of streamflows causing dewatering or unnatural flow fluctuations that diminish the quantity or quality of essential habitats
- Unnatural hydrograph and water temperatures associated with presence and operations of large dams, as well as blockage of migratory corridors
- Water chemistry problems that arise due to municipal discharge, irrigation return water, and other sources
- Altered fire regime
- Unsustainable domestic livestock grazing and timber harvest practices
- Degradation of habitat by unmanaged recreation use

Conservation Strategies

- Removal or modification of barriers in a manner that restores fish passage
- Restoration of stream channels or stream banks to a condition that simulates their natural form and function
- Modification of riparian management practices such that riparian vegetation is allowed to recover

- Screening or modification of irrigation diversions or other water intakes in a manner that prevents entrainment of fishes
- Implementation of various water conservation or flow management practices that restore essential habitats and simulate the natural hydrograph
- To the extent feasible, operate dams to mimic a more natural hydrograph in the primarystem rivers, and ensure more natural thermal regime. Provide passage over dams to ensure full migratory movement
- Work with USFWS Critical Carnivore Linkage Project
- Conservation easements and cooperative efforts to address human population growth and related impacts

References

The Nature Conservancy. 2004. Canadian Rocky Mountains Ecoregional Assessment. Four volumes including Report, Appendices, Conservation Area Descriptions & Maps.

United States Fish & Wildlife Service. 2004. Conservation Focus Areas of the Great Divide: A vast region encompassing the Upper Missouri, Yellowstone and Upper Columbia watersheds. Publisher: USFWS, Benton Lake Wildlife Refuge, Great Falls, MT. 77pgs.

Plains Grasslands and Plains Forest Ecotype



Figure 22. Plains Grassland and Plains Forest Ecotype

Montana's high eastern plains, part of America's Great Plains, are generally found on high, rolling land and on some scattered hills and wide river valleys. Some of those rivers, particularly the warm-water sections of the Yellowstone and Missouri in eastern Montana, harbor the most diverse communities of fish in the state. It's a rather harsh environment, with short, hot summers and long, cold winters that bring fewer than 15 inches of precipitation a year. In this environment, the protection offered by woody draws and the unique badlands or "breaks" provide important pockets of habitat and protection for wildlife.

In addition, Montana's unique prairie forests found in the blistered "island" mountain ranges east of the Rocky Mountains, provide a higher elevation relief where precipitation is sufficient enough to create closed-canopy forest of Great Plains ponderosa pine and various hardwoods. Although these forests are not islands in the true sense, they are a unique part of the plains landscape.

Grassland

Landscape Characteristics

The plains grassland ecotype includes 43,918,691 acres and represents 46.7% of Montana. Elevations at the western and southern edges of the plains grassland ecotype range between 3500 and 4000 feet. Elevations decrease gradually toward the northeast where the lowest point, 1900 feet, as the Missouri exits Montana, is reached. Broad areas less than 2500 feet lie near the lower Missouri and Yellowstone. For the most part the land is flat or rolling. Steeper dissected topography is found in various badland areas of the east and southeast and in river breaks areas near the Missouri and Yellowstone and some major

tributaries. Two major rivers, the Missouri and the Yellowstone, cross the entire ecotype. Flowing into these rivers are various large tributaries including the Milk, Marias, Powder, Tongue, Bighorn, and Musselshell rivers, all crossing many miles of the plains grassland. Most of the area north of the Missouri, and a little of it to the south, was overridden by the continental glaciers, creating topography that is somewhat smoother and flatter than the plains to the south. Exceptions to this are areas near some of the major rivers where erosion following glaciation has dissected the land. Glaciated plains tend to have a relatively large number of small, poorly drained depressions, some of which form potholes or small lakes.

Soils

All soils in the plains grassland ecotype are classified as cool (annual average temperatures ranging between 32^o and 47^o F.). Much of the soil in the glaciated plains (approximately north of the Missouri River) part of the ecotype contains large amounts of salt and may also be alkaline. Such soils may be medium textured with distinct topsoil horizons or they may be heavily clay soils without horizons. The second largest category of soils in the ecotype comprises those that have light colored topsoil layers and are not particularly saline or alkaline. These soils may or not have lime layers. Places with somewhat higher effective precipitation (due to greater precipitation and or/ lower evaporation) have dark, well-developed topsoil horizons with a distinct clay layer just beneath that. These tend to be the most fertile and most easily tilled soils in the ecotype.

Climate

The climate of the plains grassland ecotype can be generally characterized as semi-arid, cold in winter, warm in summer, and highly variable compared to the remainder of Montana. During much of the winter, Canadian high pressure pushes cold air south over the region. This type of weather pattern produces extremely low temperatures that may persist for days or weeks at a time, as well as low precipitation since moisture producing weather systems are subsequently routed south. During the summer, low pressure caused by high temperatures may draw moisture in from the Gulf of Mexico. The area is mostly outside of the primary track of the Pacific moisture-producing storm except for a period during late spring to early summer.

Mean annual temperatures range from 38^o F. in some areas in the extreme northeast to 48^o F. at some places south of the Yellowstone River. The mean for the ecotype is somewhere around 43^o to 44^o F. Mean January temperatures vary from 2^o F. in the northeast to 21^o F. in the south. Mean July temperatures range from 63^o to 72^o F. The highest temperatures are along the Yellowstone River whereas the lowest are in the northwest where the ecotype abuts the intermountain /foothill ecotype. Minimum yearly temperatures upon which plant hardiness zones are based, range from -38^o F. in the northeast to -24^o F. in the south. The boundary between hardiness zones 3 and 4 (mean minimum yearly

temperatures in the –30s and –20s respectively) follows a line going approximately from the southeastern corner of Montana to the Sweetgrass Hills. There is no zone 5 in this ecotype. Mean annual maximum temperatures range from 104⁰ F. along the lower Yellowstone River to 95⁰ F. at the highest elevations of the ecotype in the northwest.

Average annual precipitation in the ecotype ranges from 10 inches in a wide band along most of the highline and a southcentral area to 16 inches in some scattered eastern and southern areas. The average for the ecotype is from 12 to 14 inches. Except for some widely scattered isolated areas, the eastern portion of the ecotype tends to receive a greater proportion of its precipitation in the April 1 to July 31 (growing season) period than the west. Except for an area in the northwest, western areas near the mountains receive less than 55 percent of the precipitation in the April to August period, while most areas in the east receive over 60 percent.

Snowfall ranges from 21 to 40 inches throughout most of the area. The higher snowfalls occur in the parts of the ecotype closest to the mountains. A few isolated areas in the extreme east get less than 20 inches of snow per year. The mean number of days per year when there is at least 1 inch of snow on the ground increases from the western and southern edges of the ecotype to the northeast. The areas with the least number of days snow cover are in the Chinook zone where extremely strong and persistent winds during the winter either sublimate or melt the snow. Mean wind speeds vary from 11 to 13 miles/hour over most of the ecotype. Days with snow cover range from less than 60 to over 120 across the ecotype.

Anthropogenic

The plains grassland ecotype encompasses the largest area in Montana. Recreational activities include hunting, fishing, and snowmobiling. Major industry includes ranching and farming, which encompass some of the largest wheat and cattle yields in the country. The breakdown of landowner stewardship for plains grassland ecotype is as follows:

U.S. Federal Agencies:	6,081,573 acres, which include
BLM:	5,083,576 acres
USFS:	142,889 acres
USFWS:	716,050 acres
NPS:	556 acres
State Agencies:	2,886,994 acres
Tribal Lands:	2,532,892 acres
Private:	32,190,791 acres
City & County:	3,027 acres

Vegetation

On the semi-arid plains grasslands, vegetation communities and soil characteristics are strongly associated. The rather uniform climatic conditions across the area dictate that differences in plant community composition are primarily due to the variations in available water holding capacity of the soils. Soils are organized into categories that reflect annual precipitation as well as water holding capacity. These categories, called ecological sites, are grouped on the basis of parameters such as texture, slope topographic position, and chemical characteristics. Most of the ecotype is within the 10 to 14 inch precipitation zone and therefore, textural/topographic/chemical characteristics are the primary regulators of plant community composition.

Within the ecotype there is a relatively small number of grass species that occur as dominants throughout the area. Some of these are found in various amounts in nearly all the communities, others are more specialized and occur only under certain conditions. Other major changes in the grassland communities occur with human management because of differing responses of species to management treatments. Other than dry land farming, that totally removes native vegetation, unsustainable livestock grazing impacts the native species.

Throughout the ecotype can be found western wheatgrass (*Agropyron smithii*), needle-and-thread (*Stipa comata*), bluebunch wheatgrass (*Agropyron spicatum*), Blue grama (*Bouteloua gracilis*), prairie junegrass (*Koeleria macrantha*), green needlegrass (*Stipa viridula*), thickspike wheatgrass (*Agropyron dasystachyum*), fringed sage (*Artemisia frigida*), and dense clubmoss (*Selaginella densa*). Other widespread species common in certain conditions include little bluestem (*Andropogon scoparius*), prairie sandreed (*Calamovilfa longifolia*), silver sage (*Artemisia cana*), sun-sedge (*Carex stenophylla*), and threadleaf sedge (*Carex filifolia*). Most other grasses and grass like plants are only minor community components or are dominants in very restricted areas (Ross and hunter 1976).

In terms of biomass, forbs in plains grassland communities tend to be highly subordinate in most conditions. Certain subshrubs, including fringed sage, broom snakeweed (*Gutierrezia sarothrae*), and prickly pear (*Opuntia polyacantha*) may become dominant members of some communities following overgrazing. Varying amounts of shrubs occur throughout the plains grasslands, however, the areas where shrubs contribute a large and consistent proportion of the biomass have been included in the shrub/grassland ecotype.

Patterns of species dispersal, or chorology, and precipitation distribution influence the distribution of some species throughout the ecotype. The bluestems (warm season grasses) originated farther east in the plains region of the U.S. and generally do not penetrate much beyond the eastern third of Montana with its more continental pattern of precipitation distribution. Bluebunch wheatgrass originated in the Intermountain region of the U.S. (Barker and

Whitman 1988) where spring and winter are wet and summer dry. Although it is abundant on most sites in the western part of the ecotype, it becomes progressively less abundant and more restricted toward the east. Western wheatgrass, another important plains species, decreases toward the west. The plains grassland ecotype is a zone where mixed prairie species meet some of the Pacific/intermountain bunchgrasses, although the area is primarily dominated by the former (Wright and Wright 1948).

Coarse textured sandy soils (2% of the ecotype) have not had time to form soil cover. Widespread species favored by coarse-textured soils include needle-and-thread, little bluestem, silver sage, and threadleaf sedge (Ross and Hunter 1976) (Hansen et al. 1988). Some other species whose distribution in Montana is mostly restricted to, rather than just favored by sandy soils, include sand and big bluestems (*Andropogon hallii*, *A. gerardi*), prairie sandreed, Indian ricegrass (*Oryzopsis hymenoides*), sideoats grama (*Bouteloua curtipendula*), and *Yucca glauca*.

Medium textured soils, described as silty, occupy the greatest (over 70%) range within the ecotype. Silty soils have a good combination of relatively high water holding capacity as well as high permeability and infiltration rates. Potential natural communities in medium textured soils in the 10 to 14 inch precipitation zone are dominated by western wheatgrass and needle-and-thread. However, blue grama can become relatively abundant enough during drought periods to become dominant on many sites. This suggests that plant communities in the northern Great Plains with their extreme and variable climate are not static but vary greatly over time. Culwell et al. (1986) sampled grassland in extreme eastern Montana dominated by western wheatgrass, blue grama and threadleaf sedge. Western wheatgrass and green needlegrass constitute most coverage with run-in moisture such as swales and footslopes. Bluebunch wheatgrass is a dominant in western areas with western wheatgrass and needle-and-thread becoming much less abundant. Subdominant grasses include prairie junegrass, blue grama, sun sedge, and sometimes thickspike wheatgrass. Plains reedgrass (*Calamagrostis montanensis*) and plains muhly (*Muhlenbergia cuspidate*) may be locally dominant in some western areas. Little bluestem is locally dominant in some areas mostly in the east. The most important forb genera include *Lomatium* and *Astragalus*. In addition to the common species of the rest of the plains grassland, the areas receiving between 15 and 19 inches of annual precipitation allows the establishment of some species for which the surrounding areas are too dry. These include big bluestem (*Andropogon gerardii*) and Idaho fescue (*Festuca idahoensis*). Some plant communities on medium textured soils have been altered by cultivation or long periods of heavy grazing. Heavy grazing increases blue grama, fringed sage, clubmoss, prairie junegrass, and cheatgrass (*Bromus tectorum*) at the expense of wheatgrass and sometimes needle-and-thread.

Fine textured soil constitutes a little over 18% of the ecotype and is less favorable to species like needle-and-thread, prairie junegrass, and blue grama, although they will likely persist if adequate topsoil exists and is maintained. The finest textured soils with little or no topsoil support mostly western wheatgrass, green needlegrass, thickspike wheatgrass, and bluebunch wheatgrass in central and western parts of the ecotype (Ross and Hunter 1976). The heaviest clay soils are also usually saline and possibly alkaline. Species not adapted to such conditions are prevented from establishing and are replaced by facultative or obligate halophytes such as western wheatgrass, saltgrass (*Distichlis stricta*), green needlegrass, Nuttall saltbush (*Atriplex nuttallii*) and greasewood (*Sarcobatus vermiculatus*). In low-lying areas, species favored by periodic flooding occur. These include Nuttall alkaligrass (*Puccinellia nuttalliana*) and alkali cordgrass (*Spartina gracilis*). Areas of fine textured soils in the plains that receive greater (15 to 19 inches) precipitation than the rest of the area share many of the dominant species as the adjacent foothill regions as well as those of the rest of the plains ecotype. These foothill species include bluebunch wheatgrass and Idaho fescue. Big bluestem occurs in the easternmost areas.

Topographically complex areas in the plains grassland ecotype include the river breaks and badlands areas and are difficult to categorize vegetationally. Bluebunch wheatgrass and western wheatgrass tend to be dominant grasses in most areas. Little bluestem, prairie sand reed, needle-and-thread and green needle grass may be locally abundant. Shrubs and conifers may be locally important, especially in the breaks. Common shrubs include big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*), rubber rabbitbrush (*Chrysothamnus nauseosus*), aromatic (skunkbush) sumac (*Rhus aromatica*), snowberry (*Symphoricarpos occidentalis*), and Nuttall saltbush. Draws in the extreme eastern part of the ecotype provide habitat for certain woody species not normally found elsewhere except in the Midwest. The tree most commonly encountered is green ash (*Fraxinus pennsylvanica*). Quaking aspen (*Populus tremuloides*) is occasionally found and bur oak (*Quercus macrocarpa*) occurs in drainages of the extreme southeast (Hansen et al. 1988). Chokecherry and snowberry are shrubs commonly found in these situations. Relatively small timber stands are found scattered throughout most of the breaks area. Both ponderosa pine (*Pinus ponderosa*) and Douglas-fir (*Pseudotsuga menziesii*) occur in these stands as far east as 108.5° longitude; east of this point Douglas-fir drops out. The occurrence of these conifer species in the breaks is due to topographic conditions since the area does not receive any more precipitation than the surrounding plains. A typical timber stand in the breaks forms a closed canopy consisting of ponderosa pine and Douglas-fir. The understory shrub component is comprised of some or all of the following; snowberry, aromatic sumac, chokecherry (*Prunus virginiana*), rose (*Rosa nutkana*), and Rocky Mountain juniper (*Juniperus scopulorum*). Frequent stand replacement fires in the area result in communities comprising these shrub species but minus tree overstory. Forbs and grasses include western yarrow (*Achillea millefolium*), aster

(*Aster falcatus*), rose pussytoes (*Antennaria microphylla*), bluebunch wheatgrass, and plains muhly (*Muhlenbergia cuspidate*).

Forest

Landscape Characteristics

The plains forest ecotype includes 3,266,564 acres and represents 3.5 % of Montana. Forested areas in the plains generally occupy higher areas that represent erosional remnants of resistant rock layers, particularly the Arikaree Formation near Ekalaka. These rock layers are younger than the layers supporting the surrounding grasslands (Ross et. al. 1955). The stands of Plains Forest are located on hilly regions, mostly in the southern half of the plains part of Montana. These hilly regions may be enough higher than surrounding grasslands, such that there is increased annual precipitation capable of supporting forests. Such hilly topography may also create topoedaphic conditions suitable for the establishment of tree cover. The difference in elevation between the forested hills and the adjacent grasslands is not great, generally in the neighborhood of a few hundred to at most two thousand feet. Elevation differences much greater than this would generally result in a montane forest site. The forests of the Chalk Buttes, Longpines, and area near Hammond result from hills and/or buttes rising several hundred feet above base elevations of about 3200 to 3500 feet. The large forested area just east of Ashland occupies hills rising from low elevations of about 3000 feet near the Tongue River to approximately 4400 feet. The extensive forested region extending from near Custer, through Lame Deer to Birney ranges in elevation from 4000 to 5000 feet. The lowest elevation of the Bull Mountains forested area is roughly 3000 feet at points along the Musselshell River. Highest elevations are somewhat over 4000 feet. Most of the other scattered plains forest stands are due to elevation rise of a few to several hundred feet (i.e., east of Miles City, south of Rosebud, north of Rapeljie), topoedaphic effects (i.e., along the Yellowstone River near Columbus), or proximity to mountain areas (i.e., Longpines, Chalk Buttes).

Soils

The largest single category (80%) of soils occurring within the plains forest ecotype is described as having a relatively light-colored, thin topsoil horizon. Lime layers may be present if the parent material is calcareous. Great Groups represented include camborthids and haplargids (Montagne et al. 1982). Soils in areas with more humid regimes (14%) have thicker, darker, topsoil and Clay 'B' horizons. Major great groups are argiborolls, argixerolls, haploborolls, and haplargids. On the wettest sites (2.5%), soil characteristics of montane forests are found. These tend to be acid with a duff layer (partially decomposed leaves, etc.) on top and a redish-brown clay layer beneath that. The remaining major category of soils is the one where shale is the parent material. These clay soils

great groups include torriorthents, camborthids, ustorthents, natrargids, and paleargids.

Climate

The overall climate of the plains forest ecotype is determined by the same factors as the plains grassland, except that elevations of this ecotype are higher. These higher elevations have the effect of lowering temperatures and increasing yearly precipitation, allowing the establishment of forest.

Mean annual temperatures in the areas of plains forests generally are about 1^o to 2^o F. lower than the adjacent grasslands. In most cases this means temperatures from 43^o to 44^o F. Since most of these are in the southern or western parts of the state, their annual temperatures are several degrees higher than at lower elevations in the northeast. January temperatures generally are 1^o to 2^o lower than the surrounding grasslands, while July temperatures may be 3^o to 4^o lower. This suggests that the slight differences in elevation have more effect on summer temperatures than winter temperatures.

Total annual precipitation over the entire ecotype averages approximately 14.5 inches. Some of the wettest areas receive over 20 inches annually precipitation. There does not appear to be any difference in the proportion of precipitation received during the growing season as compared to the adjacent lower elevation grasslands. Depending on exact location, May or June is the wettest month of the year and February is the driest.

The average frost-free season is typically shorter than the adjacent grasslands due to higher elevations and the reduction of overall temperatures. The frost free seasons range from 90 to 115 days.

Anthropogenic

The plains forest ecotype is the smallest in land mass of the five major ecotype types. Recreational opportunities abound in these large pockets of forest. Activities include hiking, biking, snowmobiling, hunting, cross-country skiing, wildlife watching. The primary industries in the area are livestock grazing, mining and some timber extraction. The breakdown of landowner stewardship for plains forest ecotype is as follows:

U.S. Federal Agencies:	547,647 acres, which include
BLM:	156,850 acres
USFS:	390,797 acres
State Agencies:	155,059 acres
Tribal Lands:	285,716 acres
Private:	2,222,219 acres

Vegetation

The Plains Forest Ecotype occupies 4610 square miles. It was intended to include only areas with relatively large contiguous tracts of potential forestland in this ecotype. The Missouri breaks woodlands were included with the plains grassland ecotype described earlier in this document. Because the plains forest areas are somewhat higher in elevation than the surrounding plains grassland, precipitation conditions (a combination of higher total amounts plus a favorable growing season wet moisture distribution) favor the establishment of a closed canopy forest.

Great Plains ponderosa pine (*Pinus ponderosa* var. *scopulorum*) is the sole conifer forming the plains forests, although various hardwood tree species (i.e., American elm, *Ulmus americana*; green ash, *Fraxinus pennsylvanica*, American plum, *Prunus americana*, and bur oak, *Quercus macrocarpa*) occur along some of the draws and ravines. In contrast to the ponderosa pine west of the Divide, this variety tends to be shorter. Maximum tree heights range from 35 to 60 feet in dry situations and as much as 95 feet where there is more moisture (Arno 1979). Microclimatic conditions may be favorable in some places for Douglas-fir, *Pseudotsuga menziessii*, to establish, but apparently seed sources are too distant. The drier forests tend to be relatively open and support mostly grass understories. Grasses commonly found in these situations include: little bluestem (*Andropogon scoparius*), big bluestem (*Andropogon gerardii*), bluebunch wheatgrass (*Agropyron spicatum*), blue grama (*Bouteloua gracilis*), and threadleaf sedge (*Carex filifolia*). Moist forests contain understory species common to montane forests to the west. Species include: Canada buffaloberry (*Shepherdia canadensis*), kinnikinnik (*Arctostaphylos uvaursi*), Oregon grape (*Mahonia repens*), twinflower (*Linnaea borealis*), heartleaf arnica (*Arnica cordifolia*), fairy bells (*Disporum trachycarpum*), wintergreen (*Pyrola secunda*) and false Solomon's seal (*Smilacina stellata*).

Terrestrial Conservation Focus Areas in Greatest Need (Tier I)

Missouri Coteau (5,278,913 acres)



Figure 23. Missouri Coteau Focus Area

This area represents part of the large continental prairie grassland and pothole habitat that occurs in eastern Montana. This portion of Montana's prairie pothole country contains the highest density of natural wetlands. In most years, springtime finds this area dotted with small wetlands. These shallow wetlands shine amongst the small glacial hilltops that are covered with short- to mid-grass prairie species. Several wildlife and vegetative species in this area are unique, as this is the main portion of Montana that is considered to be part of this North American duck factory, the other being areas north of Chinook.

Landscape Characteristics

This area represents hummocky plains, outwash and stream terraces, fans, and floodplains that formed in thin glacial till and river sediments that lie over shale, siltstone, and sandstone. Moraines, kames, kettles, and small lakes also occur. Elevations range from 1,650 to 3,050 feet. Drainage density is moderate. Mean annual precipitation ranges from 12 to 15 inches, about 20 percent falling as snow. The soil temperature and moisture regimes are frigid and udic. Primary natural disturbances include elongated droughts, insects, and severe storms. Land use is predominantly wheat farming and range and pasture lands. The breakdown for land stewardship in the Missouri Coteau is as follows:

U.S. Federal Agencies:	147,337 acres, which include:
BLM:	117,375 acres
USFWS:	29,900 acres
NPS:	62 acres

3848 State Agencies: 386,782 acres
 3849 Tribal Lands: 691,154 acres
 3850 Private: 4,040,173 acres
 3851 County & City: 62 acres

3852
 3853
 3854

Associated Habitats

Habitat	Habitat Tier	Percentage of Area
Moderate/ High Cover Grasslands	I	3.57
Agricultural Lands - Irrigated	III	5.39
Wetland & Riparian	I	6.13
Altered Herbaceous	II	12.69
Low/ Moderate Cover Grasslands	I	27.71
Agricultural Lands - Dry	III	36.19

3855
 3856
 3857

Note: A total of 91.69% of the Missouri Coteau area is represented. 8.31% is made up of a combination of other habitat types.

3858

Associated Species of Greatest Conservation Need

3859
 3860

There are a total of 325 terrestrial vertebrate species that are found within the Missouri Coteau Focus Area. All associations can be found within Table 28.

3863

Amphibians: Northern Leopard Frog

3864
 3865

Birds: Common Loon, Trumpeter Swan, Bald Eagle, Yellow Rail, Whooping Crane, Piping Plover, Long-billed Curlew, Least Tern, Black Tern, Owl Burrowing, Sedge Wren, and Nelson's Sharp-tailed Sparrow

3869

Mammals: Townsend's Big-eared Bat, and Meadow Jumping Mouse

3870
 3871

Reptiles: Snapping Turtle, Spiny Softshell, Western Hognose Snake, Milk Snake, and Smooth Green Snake

3872
 3873
 3874

Conservation Concerns

3875
 3876

- Loss of habitat due to conversion of native prairie to small grain crops
- Wetland drainage
- Invasive or exotic plant species
- Disruption of natural disturbance processes or hydrologic regimes
- Oil drilling and exploration activities

3880
 3881
 3882

Conservation Strategies

3883
 3884

- Government and private conservation programs/activities that encourage and support private land stewardship

3885
 3886

- Policy-based approaches that encourage the conservation of natural communities, rather than support their conversion
- Increased cooperative efforts to maintain ecological features or processes on public lands, private and tribal
- Cooperative efforts to reduce the abundance of exotic species

References

The Nature Conservancy. 2005. Unpublished Report.

The Nature Conservancy. 1999. Ecoregional Conservation in the Northern Great Plains Steppe. Northern Great Plains Steppe Ecoregional Planning Team. 76 pgs.

United States Fish & Wildlife Service. 2004. Conservation Focus Areas of the Great Divide: A vast region encompassing the Upper Missouri, Yellowstone and Upper Columbia watersheds. Publisher: USFWS, Benton Lake Wildlife Refuge, Great Falls, MT. 77pgs.

Montana Sedimentary Plains (13,828,142 acres)



Figure 24. Montana Sedimentary Plains Focus Area

This gently sloping to rolling area contains scattered buttes and Bad Lands. It sits on heavy clay soils and consists of mostly dry shrub lands and mixed grass prairies. It receives very little precipitation and is interspersed with woody draws that contain ponderosa pine, cedar and snowberry. Agricultural practices can be found throughout the area that also supports many dry land native wildlife species such as antelope, mule deer and sage-grouse.

Landscape Characteristics

This area includes plains and hills formed in residuum and alluvium from shale and sandstone. Some lacustrine sediments also occur. Elevations range from 2,100 to 4,150 feet. Drainage density is moderate. Mean annual precipitation ranges from 10 to 14 inches, about 30 percent falling as snow. Soil temperature and moisture regimes are frigid and arctic ustic. The primary natural disturbance is fire and drought. Land use is predominantly livestock grazing with a small amount of dryland farming. The breakdown for land stewardship in the Montana Sedimentary Plains is as follows:

U.S. Federal Agencies:	1,617,799 acres, which include:
BLM:	1,414,184 acres
USFS:	134,240 acres
USFWS:	10,934 acres
NPS:	680 acres
State Agencies:	792,405 acres
Tribal Lands:	566,427 acres
Private:	10,822,908 acres
County & City:	1,050 acres

Associated Habitats

Habitat	Habitat Tier	Percentage of Area
Xeric Shrub-grassland Associations	I	2.31
Moderate/ High Cover Grasslands	I	2.42
Very Low Cover Grasslands	I	2.71
Agricultural Lands - Irrigated	III	2.86
Ponderosa Pine	II	4.52
Wetland & Riparian	I	4.64
Badlands	II	4.66
Sagebrush	I	6.77
Agricultural Lands - Dry	III	9.06
Mixed Xeric Shrubs	I	10.47
Low/ Moderate Cover Grasslands	I	41.13

Note: A total of 91.54% of the Montana Sedimentary Plains area is represented. 8.46% is made up of a combination of other habitat types.

Associated Species of Greatest Conservation Need

There are a total of 347 terrestrial vertebrate species that are found within the Montana Sedimentary Plains Focus Area. All associations can be found within Table 29.

Amphibians: Northern Leopard Frog

Birds: Common Loon, Trumpeter Swan, Bald Eagle, Sage-grouse, Whooping Crane, Mountain Plover, Long-billed Curlew, Least Tern, Black Tern, and Burrowing Owl,

Mammals: Spotted Bat, Townsend's Big-eared Bat, Black-tailed Prairie Dog, Meadow Jumping Mouse, Black-footed Ferret, Lynx, and American Bison

Reptiles: Snapping Turtle, Spiny Softshell, Western Hognose Snake, and Milk Snake

Conservation Concerns

- Loss of habitat as a result of conversion of native prairie to agriculture
- Invasive or exotic plant species
- Disruption of natural disturbance processes or hydrologic regimes
- Residential development along the river that degrades riparian areas
- Rip-rap and other bank stabilization work
- Unsustainable domestic livestock grazing practices

Conservation Strategies

- Government and private conservation programs/activities that encourage and support private land stewardship
- Policy-based approaches that encourage the conservation of natural communities, rather than support their conversion
- Increased efforts to maintain ecological features (i.e. black-tailed prairie dog colonies) or processes (i.e. fire) on public lands as they disappear from private lands.
- Cooperative efforts to reduce the abundance of exotic species
- Work with other agencies to focus on critical fire condition class areas

References

- The Nature Conservancy. 2005. Unpublished Report.
- The Nature Conservancy. 1999. Ecoregional Conservation in the Northern Great Plains Steppe. Northern Great Plains Steppe Ecoregional Planning Team. 76 pgs.
- United States Fish & Wildlife Service. 2004. Conservation Focus Areas of the Great Divide: A vast region encompassing the Upper Missouri, Yellowstone and Upper Columbia watersheds. Publisher: USFWS, Benton Lake Wildlife Refuge, Great Falls, MT. 77pgs.

Aquatic Conservation Focus Areas in Greatest Need (Tier I)

Lower Missouri River (175 River Miles)



Figure 25. Lower Missouri River Focus Area

The lower Missouri River is a land of badlands, breaks, coulees and gently rolling hills. The river runs approximately 180 river miles from Fort Peck Dam to the North Dakota border. The section of river from the Dam to the town of Wolf Point is uncharacteristically cool and clear, as water discharged from bottom of reservoir is devoid of sediment and cold. Along with many native fish species, this area is occupied by nonnative trout species. Even with flows from the Milk River, this section does not return to warm water habitat until it reaches the town of Wolf Point, approximately 70 river miles downstream. From here to the North Dakota border the Missouri remains warm, with warm water tributaries like the Poplar River, Red Water River and Big Muddy Creek. The adjacent land along the lower Missouri is primarily cottonwood-willow bottomlands and irrigated cropland. As with the area immediately below Fort Peck Dam, this area supports paddlefish, pallid sturgeon, shovelnose sturgeon, sauger, goldeye, blue sucker, river carp sucker, along with many other native fish species.

Associated Habitats

Habitat Type	Habitat Tier	Acres	Miles
Lowland Lakes	III	3021	
Lowland Reservoirs	III	374	
Mixed Source Rivers (Intermountain and Prairie Flow)	II		175
Prairie Streams	I		3228

Associated Species of Greatest Conservation Need

There are a total of 55 aquatic species that are found within the Lower Missouri River Focus Area. All associations can be found within Table 30.

Fish: Pallid Sturgeon, Paddlefish, Shortnose Gar, Sturgeon Chub, Sicklefin Chub, Pearl Dace, Blue Sucker, Burbot, and Sauger

Conservation Concerns

- Culverts, dams, irrigation diversions or other instream barriers that fully or partially impede fish movement and reduce connectivity of habitat
- Modification and degradation of stream channels caused by various construction or land management practices
- Degradation of riparian vegetation caused by various land management practices. Such activities de-stabilize streambanks, increase sediment inputs, and reduce shading
- Entrainment of juvenile and adult fishes by irrigation diversion or other water intakes
- Alterations of the quantity or timing of streamflows causing dewatering or unnatural flow fluctuations that diminish the quantity or quality of essential habitats
- Unnatural hydrograph and water temperatures associated with presence and operations of large dams, as well as blockage of migratory corridors
- Unnatural cool, clear water such as occurs below primarystem dams can adversely impact native fish populations
- Water chemistry problems can arise due to municipal discharge, irrigation return water, the discharge of waste water from coal bed methane operations, and other sources

Conservation Strategies

- Removal or modification of barriers in a manner that restores fish passage
- Restoration of stream channels or stream banks to a condition that simulates their natural form and function
- Modification of riparian management practices such that riparian vegetation is allowed to recover
- Screening or modification of irrigation diversions or other water intakes in a manner that prevents entrainment of fishes
- Implementation of various water conservation or flow management practices that restore essential habitats and simulate the natural hydrograph
- To the extent feasible, operate dams to mimic a more natural hydrograph in the primarystem rivers, and ensure more natural thermal regime. Provide passage over dams to ensure full migratory movement

Lower Yellowstone River (278 River Miles)



Figure 26. Lower Yellowstone River Focus Area

The French called it “Roche Jaune”, meaning yellow rock, to describe the lower section of the Yellowstone that is lined with trees and meanders through yellow bluffs and rimrocks on its journey toward North Dakota. This reach of the river cuts through a country of plateaus and wind carved sandstone. By the time the Yellowstone has reached the mouth of the Bighorn River it has turned from a crystal, cold mountain stream into a warm plains river. As it flows north and east it picks up strength from the Powder and Tongue rivers. In the lower Yellowstone you can find species like sauger, burbot and paddlefish.

Associated Habitats

Habitat Type	Habitat Tier	Acres	Miles
Intermountain Valley Rivers	II		1
Lowland Lakes	III	6577	
Lowland Reservoirs	III	1119	
Mixed Source Rivers (Intermountain and Prairie Flow)	II		278
Mountain Lakes	III	251	
Mountain Reservoirs	III	177	
Prairie Rivers	II		1
Prairie Streams	I		11326

Associated Species of Greatest Conservation Need

There are a total of 65 aquatic species that are found within the Lower Yellowstone River Focus Area. All associations can be found within Table 31.

Fish: Pallid Sturgeon, Paddlefish, Shortnose Gar, Sturgeon Chub, Sicklefin Chub, Pearl Dace, Blue Sucker, Burbot, and Sauger

Conservation Concerns

- Culverts, dams, irrigation diversions or other instream barriers that fully or partially impede fish movement and reduce connectivity of habitat
- Entrainment of juvenile and adult fishes by irrigation diversion or other water intakes
- Alterations of the quantity or timing of streamflows causing dewatering or unnatural flow fluctuations that diminish the quantity or quality of essential habitats
- Unnatural cool, clear water such as occurs below primarystem dams can adversely affect native fish populations
- Water chemistry problems can arise due to municipal discharge, irrigation return water, the discharge of waste water from coal bed methane operations, and other sources
- Modification and degradation of stream channels caused by various construction or land management practices
- Degradation of riparian vegetation caused by various land management practices. Such activities de-stabilize streambanks, increase sediment inputs, and reduce shading

Conservation Strategies

- Removal or modification of barriers in a manner that restores fish passage
- Restoration of stream channels or stream banks to a condition that simulates their natural form and function
- Modification of riparian management practices such that riparian vegetation is allowed to recover
- Screening or modification of irrigation diversions or other water intakes in a manner that prevents entrainment of fishes
- Implementation of various water conservation or flow management practices that restore essential habitats and simulate the natural hydrograph

Powder River (220 River Miles)



Figure 27. Powder River Focus Area

This warm prairie river originates along the eastern slopes of the Bighorn Mountains in Wyoming. Flowing 220 miles to reach the Yellowstone River, the Powder is aptly named as it is rich in sediment load. A major spawning tributary for native fishes found in the Yellowstone system, the Powder River provides spawning and nursery habitat for sauger, shovelnose sturgeon, channel catfish and many cyprinid minnow species. The flow regime of this flashy river system can fluctuate from over 2000 cfs during the March spring snowmelt period to less than 5 cfs during the hot summer days of August. Fish in this prairie river system have evolved to utilize the Powder during periods of high flow. Sauger tagged in the primary-stem Yellowstone River have been re-captured in Clear Creek, a headwater tributary to the Powder, equating to over 220 miles of travel.

Associated Habitats

Habitat Type	Habitat Tier	Acres	Miles
Lowland Lakes	III	926	
Lowland Reservoirs	III	80	
Prairie Rivers	II		220
Prairie Streams	I		3703

Associated Species of Greatest Conservation Need

There are a total of 38 aquatic species that are found within the Powder River Focus Area. All associations can be found within Table 32.

Fish: Sturgeon Chub, Burbot, and Sauger

Conservation Concerns

- Culverts, dams, irrigation diversions or other instream barriers that fully or partially impede fish movement and reduce connectivity of habitat
- Modification and degradation of stream channels caused by various construction or land management practices
- Degradation of riparian vegetation caused by various land management practices. Such activities de-stabilize streambanks, increase sediment inputs, and reduce shading
- Entrainment of juvenile and adult fishes by irrigation diversion or other water intakes
- Alterations of the quantity or timing of streamflows causing dewatering or unnatural flow fluctuations that diminish the quantity or quality of essential habitats
- Water chemistry problems that arise due to municipal discharge, irrigation return water, the discharge of waste-water from coal bed methane operations, and other sources

Conservation Strategies

- Removal or modification of barriers in a manner that restores fish passage
- Restoration of stream channels or stream banks to a condition that simulates their natural form and function
- Modification of riparian management practices such that riparian vegetation is allowed to recover
- Screening or modification of irrigation diversions or other water intakes in a manner that prevents entrainment of fishes
- Implementation of various water conservation or flow management practices that restore essential habitats and simulate the natural hydrograph

References

Tongue River (221 River Miles)



Figure 28. Tongue River Focus Area

The headwaters of the Tongue River rise in the Bighorn Mountains of Wyoming. From these sources the river flows northeast to its confluence with the Yellowstone River at Miles City. A major spawning tributary for native fishes found in the Yellowstone system, the Tongue River provides spawning and nursery habitat for sauger, shovelnose sturgeon, channel catfish and many cyprinid minnow species. The 3,500-acre Tongue River Dam controls the river's flow in Montana. Above the reservoir, the river meanders through a broad open valley. Here its main features are turbid water, slow velocity gravel and mud bottoms, and warm water temperatures. Downstream from the dam, the river flows for 10 miles through a narrow, restrictive canyon with increasing gradient and accompanying cooler water temperatures and gravel bottoms. The Tongue River again becomes a slow, meandering valley stream for its last 179 miles.

Associated Habitats

Habitat Type	Habitat Tier	Acres	Miles
Lowland Lakes	III	665	
Lowland Reservoirs	III	2176	
Mountain Lakes	III	54	
Mountain Reservoirs	III	1	
Prairie Rivers	II		221
Prairie Streams	I		4843

Associated Species of Greatest Conservation Need

There are a total of 49 aquatic species that are found within the Tongue River Focus Area. All associations can be found within Table 33.

Fish: Paddlefish, Sturgeon Chub, Blue Sucker, Burbot, and Sauger

Conservation Concerns

- Culverts, dams, irrigation diversions or other instream barriers that fully or partially impede fish movement
- Modification and degradation of stream channels caused by various construction or land management practices
- Degradation of riparian vegetation caused by various land management practices. Such activities de-stabilize streambanks, increase sediment inputs, and reduce shading
- Entrainment of juvenile and adult fishes by irrigation diversion or other water intakes
- Alterations of the quantity or timing of streamflows causing dewatering or unnatural flow fluctuations that diminish the quantity or quality of essential habitats
- Unnatural cool, clear water such as occurs below primarystem dams can adversely affect native fish populations
- Water chemistry problems that arise due to municipal discharge, irrigation return water, the discharge of waste water from coal bed methane operations, and other sources
- Loss of species (mountain whitefish and mountain sucker) below Tongue River Dam due to water management and drought

Conservation Strategies

- Removal or modification of barriers in a manner that restores fish passage
- Restoration of stream channels or stream banks to a condition that simulates their natural form and function
- Modification of riparian management practices such that riparian vegetation is allowed to recover
- Screening or modification of irrigation diversions or other water intakes in a manner that prevents entrainment of fishes
- Implementation of various water conservation or flow management practices that restore essential habitats and simulate the natural hydrograph

References

Shrub Grassland Ecotype



Figure 29. Shrub-grassland Ecotype

Montana's important, yet sporadic, shrub grasslands are found across the southern half Montana in high elevation valleys and along grassy slopes. The junipers and sagebrushes that characterize these generally dry slopes occupy only eight percent of Montana. Typically interspersed with low-cover grasslands, shrub grassland offers a unique transition that supports many of Montana's species of greatest conservation need. More than half of Montana's shrub grasslands are privately owned. Increasingly, the high and flat benches that traditionally provide grazing lands for wildlife and livestock are prized for residential development for their easy access with 100-mile views. In the coming years, long-term partnerships with landowners will be a crucial component of shrub grassland conservation.

Landscape Characteristics

The shrub grassland ecotype includes 7,240,566 acres and represents 7.7% of Montana. The southwestern segment of the shrub grassland ecotype is situated in high mountain valleys and on non-forested mountain slopes at elevations from 5,500 feet to 8,000 feet. Slopes vary from nearly level in valleys to sometimes more than 45° on some mountainsides. Mountain valleys and drainages associated with this segment include the Centennial, Big Hole, upper Beaverhead, and the valley between the Butte Highlands and Fleece Mountain. Shrub grasslands are found on slopes of the Centennial, Snowcrest, Beaverhead, Pintlar, Highland, Ruby, south Bitterroot, Tendoy and Tobacco Root mountains. A segment of shrub grassland occupies the valleys of the upper Shields and Smith rivers at elevations from 4,500 to 6,500 feet. These slopes are predominantly near level or gentle. Other areas of shrub grassland are found in the northcentral and southern plains region on mostly level or gentle slopes,

although where this ecotype occupies dissected river breaks, slopes can be locally steep. Major drainages where these shrub grasslands are located include the Clark Fork of the Yellowstone, upper Tongue and Powder rivers, Bighorn, Musselshell, Milk, central Missouri and Missouri above Fort Peck Dam, and Dry Creek. Most are located in elevations ranging from 2,000 to 3,500 feet.

Soils

Land occupied by this ecotype in the southwest is geologically the same as the adjacent grasslands or forest. Shrub grasslands in the plains dominated by Wyoming big sagebrush most commonly occur on Cretaceous shales (Colorado Shale, Montane Group, and Pierre Shale in the sedimentary plains area. Other shrub grasslands occupy a variety of geological substrates. Very little shrub grassland is found in the glaciated plains.

As well as being highly variable in terms of vegetation composition, geographic location, and geology, the shrub/grassland ecotype is variable in terms of soil characteristics. Most of the major soil categories found in Montana, except for those of alpine and subalpine situations, are represented in this ecotype (Montagne et. al 1978).

Climate

Mean annual temperature in the intermountain/foothill segment of the ecotype varies from 36° to 40° F. In the plains shrub grasslands, mean annual temperatures range from 43° to 45° F.

Because this ecotype occurs as widely separated segments across most of the southern half of the state, temperatures at a given time of year vary broadly. Due to the relatively high elevations where shrub grassland is found in the intermountain region, January daily temperatures are comparatively cold for that part of the state (12° to 19° F.). January temperatures in the plains segments are typical for whichever area of the state they are in and range from 10° to 20° F. July daily temperatures in the southwest segment range from 57° to 63° F. and on the plains they vary from 64° to 66° F. Mean annual extreme minimum temperatures across the ecotype vary from -24° to -31° F. putting most of it into the cold side of plant hardiness zone 4. Mean annual maximum temperatures may be anywhere from less than 85° F. in the southwest to over 102° F. in the southeast.

Average length of time without frost is shortest in the southwest and may only be 30 days in some places. The frost free period is the greatest in those segments near the lower Yellowstone and Missouri rivers where it may range from 115 to 130 days.

The percentage of precipitation received during the growing season is highly variable within the southwest segment, ranging from 35 to 60 percent depending on the area. The shrub and grassland around White Sulfur Springs receives 40 to 45 percent of its moisture in the growing season. In other segments of shrub grassland, 50 to 62 percent of moisture falls during the growing season.

Snowfall for the shrub/grassland areas in or near the mountains, except for the segment south of the Pryor Mountains, generally ranges from 31 to 90 inches each year. Mean number of days with snowcover in these areas varies from 90 to 160 days. An area of shrub/grassland south of the Pryor Mountains averages less than 30 inches of mean annual snowfall and generally has snow on the ground less than 60 days. The other areas generally average between 20 and 50 inches of snowfall with 60 to 100 days of snowcover.

Anthropogenic

The shrub grassland ecotype is some of the most undeveloped habitat in the state. Recreationalists and agriculturalists enjoy and appreciate it. The breakdown of landowner stewardship for shrub grassland ecotype is as follows:

U.S. Federal Agencies:	1,851,561 acres, which include
BLM:	1,574,556 acres
USFS:	228,634 acres
USFWS:	42,008 acres
NPS:	1,977 acres
State Agencies:	668,049 acres
Tribal Lands:	260,264 acres
Private:	4,431,526 acres
City & County:	0 acres

Vegetation

In areas of the shrub grassland ecotype that has fine textured soils and receives 10 to 14 inches of annual precipitation, the predominant species of vegetation is the big sagebrush (*Artemisia tridentate* ssp). Big sagebrush dominated communities in this area normally are found on fine textured to very fine textured soils. Such areas are estimated to cover 65% of the ecotype. Where there is more available moisture due to run in or high water table, silver sagebrush (*Artemisia cana*) or greasewood (*Sarcobatus vermiculatus*) may be abundant. Silver sagebrush is favored by medium textured non-saline soils; greasewood is usually found on dense clay saline and/or alkaline soils. Silver sagebrush bottomlands in Theodore Roosevelt National Park described by Hansen et al. 1988 are probably similar to such communities in eastern Montana. Dominant species in these areas are silver sagebrush, western wheatgrass (*Agropyron smithii*), and green needlegrass (*Stipa viridula*). The dominant understory species under big sagebrush in eastern areas are western wheatgrass, prairie

junegrass (*Koeleria macrantha*), and green needlegrass. Other common species include nuttall saltbush (*Atriplex nuttallii*), bluebunch wheatgrass (*Agropyron spicatum*), and various milkvetches (*Astragalus* spp.). In the west, dominant grasses are bluebunch wheatgrass, western wheatgrass, and prairie junegrass. Common forbes are milkvetches, American vetch (*Vicia Americana*), and biscuitroot (*Lomatium* spp.).

Where big sagebrush is the dominant species on silty soils in the 10 to 14 inch precipitation zone, the most abundant grasses are needle and thread (*Stipa comata*) and western wheatgrass in the east and bluebunch wheatgrass in the west (Ross et al. 1976) (Mueuggler et al. 1980). On limy, shallow and very shallow soils bluebunch wheatgrass is typically dominant. Communities containing both low sagebrush (*Artemisia arbuscula*) and big sagebrush are found in some areas of extreme southwest Montana east of the continental divide. These sites are often on limestone. Subdominant grasses include prairie junegrass and sandberg bluegrass (*Poa secunda*). Common forbs are hood's plox (*Phlox hoodii*) and blue flax (*Linum perenne*). Curleaf mountain mahogany (*Cercocarpus ledifolius*) is another shrub restricted to the extreme southwestern part of the state. A bitterbrush (*Purshia tridentate*)/bluebunch wheatgrass habitat type is recognized west of the divide and an aromatic sumac (*Rhus aromatica*)/bluebunch wheatgrass type occurs in southcentral Montana. Other shrubs such as big sagebrush, rubber rabbitbrush (*Chrysothamnus nauseosus*), and Rocky Mountain juniper (*Juniperus scopulorum*) may be important in these types. Finally, on saline lowlands, a greasewood/western wheatgrass habitat is recognized and on uplands a greasewood/basin wildrye (*Elymus cinereus*) type.

The areas of the shrub grassland ecotype where annual precipitation is from 15 to 19 inches are usually higher in elevation than those with annual precipitation between 10 to 14 inches. The most abundant shrub species is generally mountain big sagebrush (*Artemisia tridentate* ssp. *vaseyana*), although there may be some Wyoming big sagebrush, rubber rabbit brush, and bitterbrush. Where these shrub/grasslands occur in southwestern Montana, bluebunch wheatgrass is still an important grass species as in the 10 to 14 inch precipitation areas, but Idaho fescue is considered to be dominant. North of 46° Idaho fescue is replaced by rough fescue (*Festuca scabrella*) as the dominant grass. These sites generally have more abundant and diverse forbs than the drier areas. In the higher precipitation areas that are well drained, typically with steep slopes, coarse textured shallow soils and often southerly exposures, the most abundant species is generally bitterbrush. West of the divide and north of 47° rough fescue is the most productive grass. South of 47° Idaho fescue or Idaho fescue and bluebunch wheatgrass are the most productive. On some sites mountain big sagebrush may be as abundant as bitterbrush. Arrowleaf balsamroot (*Balsamorhiza sagittata*) and silky lupine (*Lupinus sericeus*) are very common both north and south.

Terrestrial Conservation Focus Areas in Greatest Need (Tier I)

Bighorn Intermontane Basin (290,287 acres)



Figure 30. Bighorn Intermontane Basin Focus Area

The basin protrudes across Montana's border from Wyoming and sits in the rain shadow of the Beartooth Range. The area is home to a very diverse wildlife community and represents a limited geographic area at the end of its range that resembles communities more typical of the Great Basin and Colorado Plateau than Montana. Riparian areas are limited minor drainages and it is the driest area in Montana typically receiving only 6 inches of precipitation annually. Snow seldom lasts long due to the predominate and seemingly ever present southwest winds. Native vegetation is generally dominated by shrubs primarily black sagebrush, Wyoming big sagebrush and greasewood. Understory grasses are generally sparse with invading annuals such as cheatgrass often dominating. This is the home of the prairie rattlesnake as well as the sagebrush and horned lizards. Sage-grouse are abundant as are gray partridges. This is the only habitat in Montana that supports the chukar partridge. However, given the desert nature of the habitat mule deer and pronghorn antelope can exist only in low densities.

Landscape Characteristics

This subsection is composed of dissected plains, hills, terraces, and fans that formed in shale, siltstone, and sandstone overlain by some alluvium and lacustrine sediment. Elevations range from 3,700 to 4,700 feet. Drainage density is moderate. Mean annual precipitation ranges from 5 to 12 inches. The soil temperature and moisture regimes are mesic and ustic aridic. Winters are very dry. The primary natural disturbance is drought. Land use is predominantly

livestock grazing and irrigated cropland. The breakdown for land stewardship in the Bighorn intermontane basin is as follows:

U.S. Federal Agencies: 163,275 acres, which include:
 BLM: 157,097 acres
 USFS: 3,707 acres
 NPS: 2,471 acres
 State Agencies: 14,517 acres
 Tribal Lands: 4,819 acres
 Private: 107,676 acres

Associated Habitats

Habitat	Habitat Tier	Percentage of Area
Agricultural Lands - Irrigated	III	2.46
Low/ Moderate Cover Grasslands	I	3.44
Utah Juniper	III	3.73
Xeric Shrub-grassland Associations	I	5.67
Badlands	II	17.19
Very Low Cover Grasslands	I	28.28
Sagebrush	I	33.78

Note: A total of 94.55% of the Bighorn Intermontane Basin area is represented. 5.45% is made up of a combination of other habitat types.

Associated Species of Greatest Conservation Need

There are a total of 174 terrestrial vertebrate species that are found within the Bighorn Intermontane Basin Focus Area. All associations can be found within Table 34.

Amphibians: Northern Leopard Frog

Birds: Bald Eagle, Sage-grouse, Mountain Plover, Long-billed Curlew, and Burrowing Owl

Mammals: Spotted Bat, Pallid Bat, Black-tailed Prairie Dog, White-tailed Prairie Dog, Gray Wolf, and Black-footed Ferret

Reptiles: Western Hognose Snake and Milk Snake

Conservation Concerns

- Energy exploration and development impacts
- Invasive or exotic plant or animal species
- Disruption of natural fire disturbance processes

- Unsustainable domestic livestock grazing practices

Conservation Strategies

- None have been identified

References

A Biological Conservation Assessment for the Utah-Wyoming Rocky Mountain Ecoregion: Report to the Nature Conservancy. 2001. R. Noss, G. Wuerthner, K. Vance-Borland, and C. Carroll. Conservation Science, Inc. 125 pp. + Executive Summary and Appendix D.

United States Fish & Wildlife Service. 2004. Conservation Focus Areas of the Great Divide: A vast region encompassing the Upper Missouri, Yellowstone and Upper Columbia watersheds. Publisher: USFWS, Benton Lake Wildlife Refuge, Great Falls, MT. 77pgs.

Montana Glaciated Plains (17,806,106 acres)



Figure 31. Montana Glaciated Plains Focus Area

Montana Glaciated Plains are dominated by level to rolling till plains covered by sagebrush grasslands and mixed short-grass prairie and croplands. This area also encompasses two island mountain ranges: the Bearpaw and Highwood Mountains. The major river drainages of the area include the Milk, Missouri, Marias, and Musselshell Rivers. In the east, this focus area is characterized by prairie that is dissected by badland of the major tributaries to the Milk, Missouri, Marias and Musselshell drainages. From the bluffs dotted with ancient teepee rings, one can observe the numerous prairie wildlife species. To the west, the area is characterized by the numerous rugged breaks that support diverse assemblages of ponderosa pine and cottonwoods depending on the availability of moisture. This area is also considered very fertile wheat growing country, most notable found in the Golden Triangle to the west.

Landscape Characteristics

This area has plains, terraces, fans and floodplains that formed in glacial till, gravel deposits, and alluvium over clay shale, sandstone, and siltstone. Elevations range from 1,800 to 7,500 feet in the Highwoods and Bearpaws. Drainage density is moderate and glacial potholes are common, especially in the northern part of subsection. Mean annual precipitation ranges from 10 to 15 inches, about 20 to 30 percent falling as snow. The soil temperature and moisture regimes are frigid and aridic ustic. The primary natural disturbance is drought. Land use is predominantly livestock grazing as well as dryland farming. The breakdown for land stewardship in the Montana glaciated plains is as follows:

U.S. Federal Agencies: 3,394,302 acres, which include:

4536 BLM: 3,003,010 acres
 4537 USFS: 62 acres
 4538 USFWS: 283,492 acres
 4539 NPS: 247 acres
 4540 State Agencies: 1,253,566 acres
 4541 Tribal Lands: 1,141,133 acres
 4542 Private: 11,995,485 acres
 4543 County & City: 494 acres

4544 **Associated Habitats**

Habitat	Habitat Tier	Percentage of Area
Wetland & Riparian	I	3.22
Moderate/ High Cover Grasslands	I	3.38
Altered Herbaceous	II	4.33
Sagebrush	I	4.67
Very Low Cover Grasslands	I	4.79
Agricultural Lands - Irrigated	III	13.87
Agricultural Lands - Dry	III	20.19
Low/ Moderate Cover Grasslands	I	33.66

4547
 4548 Note: A total of 88.11% of the Montana Glaciated Plains area is represented. 11.89% is made up of a combination of
 4549 other habitat types.

4550
 4551 **Associated Species of Greatest Conservation Need**

4552
 4553 There are a total of 368 terrestrial vertebrate species that are found within the
 4554 Montana Glaciated Plains Focus Area. All associations can be found within Table
 4555 35.

4556
 4557 **Amphibians:** Northern Leopard Frog

4558
 4559 **Bird:** Common Loon, Bald Eagle, Sage-grouse, Yellow Rail, Whooping Crane,
 4560 Piping Plover, Mountain Plover, Long-billed Curlew, Least Tern, Black Tern,
 4561 Burrowing Owl, Sedge Wren, and Nelson's Sharp-tailed Sparrow

4562
 4563 **Mammals:** Spotted Bat, Townsend's Big-eared Bat, Black-tailed Prairie Dog,
 4564 Black-footed Ferret, Lynx, and American Bison (not currently present)

4565
 4566 **Reptiles:** Snapping Turtle, Spiny Softshell, Western Hognose Snake, and Milk
 4567 Snake

4568
 4569 **Conservation Concerns**

- 4570
 4571
 4572
- Conversion of native prairie to small grain production
 - Petroleum exploration and development impacts

- Invasive or exotic plant species
- Disruption of natural fire disturbance processes and hydrologic regimes
- Unsustainable domestic livestock grazing practices
- Rip-rap and other bank stabilization work

Conservation Strategies

- Government and private conservation programs/activities that encourage and support private land stewardship
- Policy-based approaches that encourage the conservation of natural rangeland communities, rather than support their conversion
- Increased efforts to maintain ecological features (i.e. black-tailed prairie dog colonies) or processes (i.e. fire) on public lands as they disappear from private lands
- Cooperative efforts to reduce the abundance of exotic species
- Implement practices (economic & ecological) that sustain ranching profitability and promote free public access
- Maintain existing structure and functional uses of wetlands on private and federally managed lands
- Evaluate ecological implications of road development as well as reservoir and pit retention construction with the purpose of informing BLM managers, with specific implications on declining species and spread of invasive species

References

- The Nature Conservancy. 2005. Unpublished Report.
- The Nature Conservancy. 1999. Ecoregional Conservation in the Northern Great Plains Steppe. Northern Great Plains Steppe Ecoregional Planning Team. 76 pgs.
- United States Fish & Wildlife Service. 2004. Conservation Focus Areas of the Great Divide: A vast region encompassing the Upper Missouri, Yellowstone and Upper Columbia watersheds. Publisher: USFWS, Benton Lake Wildlife Refuge, Great Falls, MT. 77pgs.
- Whitewater Wetlands Conservation Area Plan. 2004. B. Martin & J. Stutzman, 16 pp + appendices.

Montana Shale Plains (2,403,965 acres)

Figure 32. Montana Shale Plains Focus Area

Much of this area can be considered mountain foothill terrain that contains many woody draws with ponderosa pine and cedar stands throughout.

Landscape Characteristics

This section has dissected plains, hills, terraces, fans, and floodplains that formed in shale, siltstone, and sandstone. Elevations range from 1,500 to 3,500 feet. Drainage density is moderate to high. Mean annual precipitation ranges from 10 to 14 inches, about 30 percent falling as snow. The soil temperature and moisture regimes are frigid and aridic ustic. Summers are dry. The primary natural disturbance is drought and erosion. Land use is predominantly livestock grazing with some dryland farming. The breakdown for land stewardship in the Montana shale plains is as follows:

U.S. Federal Agencies:	278,550 acres, which include:
BLM:	275,461 acres
USFWS:	3,089 acres
State Agencies:	158,889 acres
Private:	1,965,538 acres

Associated Habitats

Habitat	Habitat Tier	Percentage of Area
Wetland & Riparian	I	2.46
Agricultural Lands - Dry	III	4.66
Xeric Shrub-grassland Associations	I	4.68

Moderate/ High Cover Grasslands	I	5.04
Very Low Cover Grasslands	I	6.45
Badlands	II	8.04
Sagebrush	I	8.48
Mixed Xeric Shrubs	I	16.51
Low/ Moderate Cover Grasslands	I	36.35

Note: A total of 92.67% of the Montana Shale Plains area is represented. 7.33% is made up of a combination of other habitat types.

Associated Species of Greatest Conservation Need

There are a total of 307 terrestrial vertebrate species that are found within the Montana Shale Plains Focus Area. All associations can be found within Table 36.

Amphibians: Northern Leopard Frog

Birds: Common Loon, Bald Eagle, Sage-grouse, Whooping Crane, Mountain Plover, Long-billed Curlew, Black Tern, and Burrowing Owl,

Mammals: Townsend's Big-eared Bat, Black-tailed Prairie Dog, Meadow Jumping Mouse, Black-footed Ferret, Lynx, and American Bison

Reptiles: Spiny Softshell, Western Hognose Snake, and Milk Snake

Conservation Concerns

- Dewatering as a result of water diversions
- Invasive or exotic plant species
- Disruption of natural disturbance processes or hydrologic regimes

Conservation Strategies

- Government and private conservation programs/activities that encourage and support private land stewardship
- Policy-based approaches that encourage the conservation of natural communities, rather than support their conversion
- Increased efforts to maintain ecological features (i.e. black-tailed prairie dog colonies) or processes (i.e. fire) on public lands as they disappear from private lands.
- Cooperative efforts to reduce the abundance of invasive or exotic species

References

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4678 The Nature Conservancy. 1999. Ecoregional Conservation in the Northern Great
4679 Plains Steppe. Northern Great Plains Steppe Ecoregional Planning Team. 76
4680 pgs.

4681

4682 United States Fish & Wildlife Service. 2004. Conservation Focus Areas of the
4683 Great Divide: A vast region encompassing the Upper Missouri, Yellowstone and
4684 Upper Columbia watersheds. Publisher: USFWS, Benton Lake Wildlife Refuge,
4685 Great Falls, MT. 77pgs.

4686

4687

Powder River Basin/Breaks/Scoria Hills (2,095,021 acres)



Figure 33. Powder River Basin/Breaks/Scoria Hills Focus Area

Much of this unglaciated area extends across Montana's border into Wyoming. The flat to rolling mixed grass prairie contains considerable areas of sagebrush grassland as well as ponderosa pine and juniper woodlands that are broken by occasional rugged breaks. The Powder River that cuts through the area provides significant riparian habitat for many species. This area supports irrigated and dryland crops.

Landscape Characteristics

This section has dissected plains and hills, terraces, and fans with some river breaks and badlands that formed in alluvium and colluvium from sandstone, shale, and siltstone. Elevations range from 2,100 to 4,980 feet. Drainage density is moderate to high. Mean annual precipitation ranges from 10 to 14 inches, about 20 percent falling as snow. The soil temperature and moisture regimes are frigid and aridic ustic. Summers are dry. The primary natural disturbance is drought and erosion. Land use is predominantly livestock grazing, irrigated and dryland crops. The breakdown for land stewardship in the Powder River Basin/Breaks/Scoria Hills is as follows:

U.S. Federal Agencies:	503,292 acres, which include:
BLM:	197,993 acres
USFS:	304,928 acres
NPS:	371 acres
State Agencies:	90,873 acres
Tribal Lands:	313,824 acres
Private:	1,186,909 acres

Associated Habitats

Habitat	Habitat Tier	Percentage of Area
Very Low Cover Grasslands	I	2.70
Mixed Mesic Shrubs	II	3.31
Sagebrush	I	5.30
Wetland & Riparian	I	6.21
Mesic Shrub-grassland Associations	I	7.42
Low Density Xeric Forest	II	8.15
Mixed Xeric Shrubs	I	10.04
Ponderosa Pine	II	11.60
Low/ Moderate Cover Grasslands	I	31.86

Note: A total of 86.59% of the Powder River Basin/Breaks/Scoria Hills area is represented. 13.41% is made up of a combination of other habitat types.

Associated Species of Greatest Conservation Need

There are a total of 299 terrestrial vertebrate species that are found within the Powder River Basin/Breaks/Scoria Hills Focus Area. All associations can be found within Table 37.

Amphibians: Northern Leopard Frog

Birds: Common Loon, Trumpeter Swan, Bald Eagle, Sage-grouse, Whooping Crane, Long-billed Curlew, Black Tern, and Burrowing Owl,

Mammals: Spotted Bat, Townsend's Big-eared Bat, Black-tailed Prairie Dog, Meadow Jumping Mouse, Black-footed Ferret, and American Bison

Reptiles: Snapping Turtle, Spiny Softshell, Western Hognose Snake, and Milk Snake

Conservation Concerns

- Energy exploration and development impacts
- Invasive or exotic species
- Disruption of natural disturbance processes or hydrologic regimes
- Loss or habitat due to conversion of native prairie to agriculture

Conservation Strategies

- Government and private conservation programs/activities that encourage and support private land stewardship
- Policy-based approaches that encourage the conservation of natural communities, rather than support their conversion

- Increased efforts to maintain ecological features (i.e. black-tailed prairie dog colonies) or processes (i.e. fire) on public lands as they disappear from private lands.
- Cooperative efforts to reduce the abundance of exotic species
- Cooperative efforts to achieve sustainable grazing practices on public and private lands

References

The Nature Conservancy. 1999. Ecoregional Conservation in the Northern Great Plains Steppe. Northern Great Plains Steppe Ecoregional Planning Team. 76 pgs.

United States Fish & Wildlife Service. 2004. Conservation Focus Areas of the Great Divide: A vast region encompassing the Upper Missouri, Yellowstone and Upper Columbia watersheds. Publisher: USFWS, Benton Lake Wildlife Refuge, Great Falls, MT. 77pgs.

Shale Scablands (417,176 acres)

Figure 34. Shale Scablands Focus Area

This very dry area is covered mostly by sagebrush grassland that is intersected with woody draws. The species that make up the woody draws are mostly green ash, buffaloberry, chokecherry and some juniper.

Landscape Characteristics

This section is dissected shale plains formed in calcareous shale, claystone, and sandstone. Elevations range from 2,650 to 4,100 feet. Drainage density is high. Mean annual precipitation ranges from 11 to 15 inches, about 20 percent falling as snow. The soil temperature and moisture regimes are frigid and aridic ustic. The primary natural disturbance is drought. Land use is predominantly livestock grazing. The breakdown for land stewardship in the shale scablands is as follows:

U.S. Federal Agencies:	126,889 acres, which include:
BLM:	126,889 acres
State Agencies:	21,992 acres
Private:	268,295 acres

Associated Habitats

Habitat	Habitat Tier	Percentage of Area
Mixed Broadleaf Forest	I	2.22
Mesic Shrub-grassland Associations	I	3.01
Low Density Xeric Forest	II	3.17
Moderate/ High Cover Grasslands	I	3.47

Rock	III	4.40
Mixed Mesic Shrubs	II	4.60
Mixed Xeric Shrubs	I	5.42
Very Low Cover Grasslands	I	5.49
Badlands	II	7.60
Wetland & Riparian	I	8.50
Salt-desert Shrub/ Dry Salt Flats	I	8.56
Low/ Moderate Cover Grasslands	I	13.01
Sagebrush	I	25.05

Note: A total of 94.52% of the Shale Scablands area is represented. 5.48% is made up of a combination of other habitat types.

Associated Species of Greatest Conservation Need

There are a total of 246 terrestrial vertebrate species that are found within the Shale Scablands Focus Area. All associations can be found within Table 38.

Amphibians: Northern Leopard Frog

Birds: Common Loon, Bald Eagle, Sage-grouse, Whooping Crane, Mountain Plover, Long-billed Curlew, Black Tern, and Burrowing Owl,

Mammals: Townsend's Big-eared Bat, Black-tailed Prairie Dog, Hispid Pocket Mouse, Meadow Jumping Mouse, and Black-footed Ferret

Reptiles: Snapping Turtle, Spiny Softshell, Western Hognose Snake, and Milk Snake

Conservation Concerns

- Unsustainable domestic livestock grazing practices
- Loss of natural fire regime
- Invasive or exotic species
- Loss of habitat as a result of conversion to agriculture

Conservation Strategies

- Government and private conservation programs/activities that encourage and support private land stewardship
- Policy-based approaches that encourage the conservation of natural communities, rather than support their conversion
- Increased efforts to maintain ecological features (i.e. black-tailed prairie dog colonies) or processes (i.e. fire) on public lands as they disappear from private lands.
- Cooperative efforts to reduce the abundance of exotic species

4836

4837 **References**

4838

4839 The Nature Conservancy. 1999. Ecoregional Conservation in the Northern Great
4840 Plains Steppe. Northern Great Plains Steppe Ecoregional Planning Team. 76
4841 pgs.

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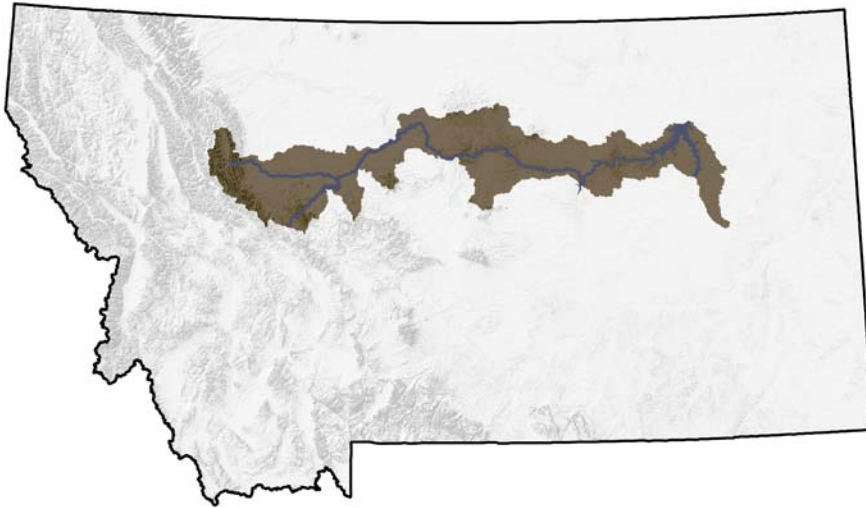
Aquatic Conservation Focus Areas in Greatest Need (Tier I)**Middle Missouri River (540 River Miles)**

Figure 35. Middle Missouri River and Tributaries Focus Area

Once the Missouri River reaches the confluence with Hardy Creek, it becomes wide and slow for the next 60 miles and then turns into whitewater as it flows over the falls at Great Falls. Although dams have effectively covered the falls, the original cascade posed a tremendous obstacle for Lewis and Clark. From here down stream for more than two hundred miles to Fort Peck Reservoir is the longest free flowing section of the entire Missouri River. One hundred and fifty miles of this has been designated as Wild and Scenic and flows through cottonwood forests and canyons.

Associated Habitats

Habitat Type	Habitat Tier	Acres	Miles
Intermountain Valley Streams	II		2170
Lowland Lakes	III	281756	
Lowland Reservoirs	III	4505	
Mixed Source Rivers (Intermountain and Prairie Flow)	II		438
Mountain Lakes	III	1139	
Mountain Reservoirs	III	1445	
Mountain Streams	I		2289
Prairie Rivers	II		148
Prairie Streams	I		8909

Associated Species of Greatest Conservation Need

There are a total of 67 aquatic species that are found within the Middle Missouri River and Tributaries Focus Area. All associations can be found within Table 39.

Fish: Pallid Sturgeon, Paddlefish, Shortnose Gar, Sturgeon Chub, Sicklefin Chub, Blue Sucker, Burbot, and Sauger

Conservation Concerns

- Culverts, dams, irrigation diversions or other instream barriers that fully or partially impede fish movement and reduce connectivity of habitat
- Modification and degradation of stream channels caused by various construction or land management practices
- Degradation of riparian vegetation caused by various land management practices. Such activities de-stabilize streambanks, increase sediment inputs, and reduce shading
- Entrainment of juvenile and adult fishes by irrigation diversion or other water intakes
- Alterations of the quantity or timing of streamflows causing dewatering or unnatural flow fluctuations that diminish the quantity or quality of essential habitats
- Unnatural hydrograph and water temperatures associated with presence and operations of large dams, as well as blockage of migratory corridors
- Unnatural cool, clear water such as occurs below primarystem dams can adversely affect native fish populations
- Water chemistry problems can arise due to municipal discharge, irrigation return water, the discharge of waste water from coal bed methane operations, and other sources

Conservation Strategies

- Removal or modification of barriers in a manner that restores fish passage
- Augment in-stream flows through leases and water conservation measures
- Restoration of stream channels or stream banks to a condition that simulates their natural form and function
- Modification of riparian management practices such that riparian vegetation is allowed to recover
- Screening or modification of irrigation diversions or other water intakes in a manner that prevents entrainment of fishes
- Implementation of various water conservation or flow management practices that restore essential habitats and simulate the natural hydrograph

- To the extent feasible, operate dams to mimic a more natural hydrograph in the primary system rivers, and ensure more natural thermal regime. Provide passage over dams to ensure full migratory movement

References

Component II: Community Types of Greatest Conservation Need

“This is a high leverage strategy to address the conservation concerns of whole ecological communities or species groupings. Implementing conservation strategies at this level will comprehensively benefit many fish and wildlife species.”

Fish and wildlife communities have not been formally defined for Montana’s complex biological systems. For this Strategy, landscape characteristics, vegetative cover type, and associated fish and wildlife species were linked in order to begin describing community types. Future efforts to provide complete classifications of Montana’s fish and wildlife communities will be critical for implementing this Strategy and monitoring conservation success.

Conservation at the community level provides potential to leverage conservation resources to benefit large numbers of species. Community types also provide a way to associate numerous species through common habitat requirements. These communities of plants and animals often face similar conservation concerns that can be addressed simultaneously. In the focus area component of this Strategy, geographic areas were identified that offer some of the greatest potential to conserve the community types and species in greatest need of conservation. The following community types have been identified as Tier I (in greatest need of conservation) and efforts to conserve them should not be limited to the focus areas identified in Component I. Efforts should be made to address the conservation Strategies identified for these community types across the state regardless of where they occur.

Grassland Complexes (31,551,627 acres or 33.53% of Montana)

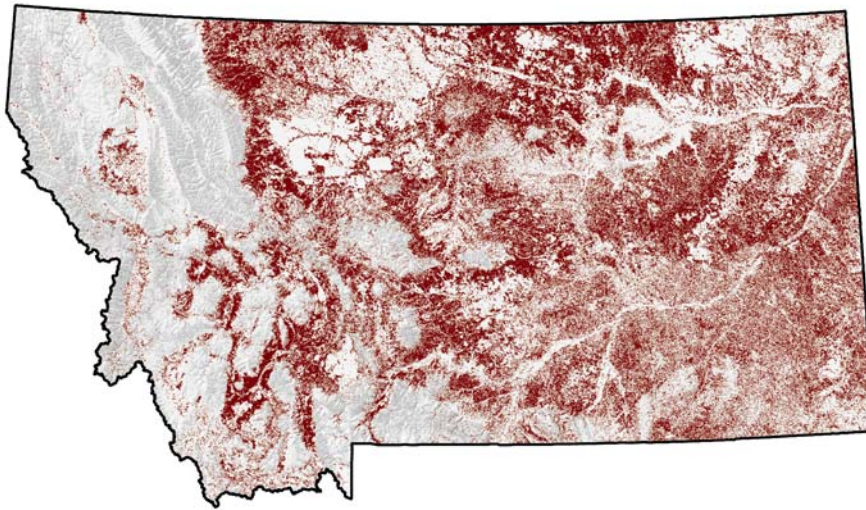


Figure 37. Distribution of Grassland Community Types

Grassland communities occur in broad western mountain valleys, high mountain meadows, and on the plains of eastern Montana. Very low to high cover grasses are characteristic of these areas and this array of grass types are found in open lands and often interspersed among shrubs. This community type is essentially associated with more terrestrial species in greatest need of conservation than any other community type in Montana.

Grassland habitats are difficult to meaningfully differentiate using only remotely sensed data like the GAP mapping. Types based on the relative cover of grass are not ecologically based or directly related to habitat conditions. Descriptions of GAP grassland types are very broad and include some species that are not common in Montana or do not occur together. A classification and mapping system that incorporates ecological data and is associated with a recognized vegetation classification like the National Vegetation Classification System will have greater management applicability in the future and should be supported.

Very low cover grasslands occur primarily in central and eastern Montana valleys. Semi-desert grasslands with total grass cover from 10-30% cover. Dominated by short grasses and forbs. Typically has a high amount of bare soil (20-60% cover). Grasslands with production ranges of 50-300 lb/ac. usually associated with alkaline soils and/or disturbed sites. Low/Moderate cover grasslands occur across the state in valleys and foothills. Occurs on middle to high elevation mountain slopes on south aspects. Low to moderate cover grasslands with total grass cover from 20-70%. Dominated by short to medium height grasses and forbs. Grasslands with production ranges from 300-1800 lb/ac. Includes rangelands and non-irrigated pastures. Moderate to high cover grasslands include total grass cover from 50-100%. Dominated by medium to tall

grasses in prairie areas. Grasslands with production ranges from 1000-7000 lb/ac. Moderate/High cover grasslands are associated with wet sites.

Essential Associated Plant Community

Arrowleaf Balsamroot (*Balsamorhiza sagittata*)
Big Bluestem (*Andropogon gerardii*)
Bluebunch Wheatgrass (*Agropyron spicatum*)
Blue grama (*Bouteloua gracilis*)
Bluestem (*Andropogon spp.*)
Carex species (*Carex spp.*)
Clubmoss (*Selaginella densa*)
Elk Sedge (*Carex geyeri*)
Green Needlegrass (*Stipa viridula*)
Hood's Phlox (*Phylox hoodii*)
Idaho Fescue (*Festuca idahoensis*)
Indian grass (*Sorghum nutans*)
Little Bluestem (*Andropogon scoparium*)
Lupine (*Lupinus spp.*)
Missouri Goldenrod (*Solidago missouriense*)
Needle & Thread grass (*Stipa comata*)
Prairie June grass (*Koeleria spp.*)
Prairie Sandreed (*Calamovilfa longifolia*)
Rough Fescue (*Festuca scabrella*)
Sandberg's bluegrass (*Poa sandbergii*)
Sun Sedge (*Carex heliophila*)
Switchgrass (*Panicum virgatum*)
Threadleaf Sedge (*Carex filifolia*)
Timothy (*Phleum pratensis*)
Western Wheatgrass (*Agropyron smithii*)

Associated Species of Greatest Conservation Need

There are a total of 364 terrestrial vertebrate species that are found within the Grassland Complexes Community Type, with 202 of these species being essentially associated. These species will be bolded to denote essentially associated. All associations can be found within Table 40.

Amphibians: Boreal Toad and **Northern Leopard Frog**

Birds: Trumpeter Swan, **Sage-grouse**, **Columbia Sharp-tailed Grouse**, Yellow Rail, **Whooping Crane**, Piping Plover, **Mountain Plover**, **Long-billed Curlew**, Black Tern, Flammulated Owl, **Burrowing Owl**, **Sedge Wren**, and **Nelson's Sharp-tailed Sparrow**

Mammals: Spotted Bat, Townsend's Big-eared Bat, Pallid Bat, Pygmy Rabbit, Black-tailed Prairie Dog, White-tailed Prairie Dog, Great Basin Pocket Mouse, Meadow Jumping Mouse, Grizzly Bear, Black-footed Ferret, Lynx, and American Bison

Reptiles: Snapping Turtle, Spiny Softshell, Western Hognose Snake, Milk Snake, and Smooth Green Snake

Conservation Concerns

- Spread of noxious weeds and nonnative plants, especially knapweed and leafy spurge
- Oil, gas, geothermal and coal extraction and development
- Impacts from recreational use
- Fragmentation and loss due to agricultural and subdivision development
- Unsustainable grazing, & residual effects from herbicide spraying

Conservation Strategies

- Incentives and education for private landowners to protect natural habitat
- Prevent the introduction and spread of noxious weeds on existing tracts of palouse prairie
- Reestablish fire regime
- Conservation easements or other protection of natural habitat to provide large blocks of short grass types in a diverse mosaic of habitats
- Maintain the appropriate species composition, vertical and horizontal structure on existing tracts by developing appropriate grazing strategies
- Restore areas infested with the highly flammable, invasive cheatgrass, returning them to native grasses and forbs
- Monitor leasing and development decisions and regulations applying to geophysical exploration
- Work with the public to establish sustainable recreation management practices, including designations of lands open, limited, or closed to off-road vehicle use

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5067

5068

Mixed Broadleaf Forests (883,498 acres or 0.94% of Montana)



Figure 37. Distribution of Mixed Broadleaf Forest Community Types

Aspen Galleries

Galleries often occur within grassland openings or along the border between grasslands openings and coniferous forests. When mature, these galleries often support native tall-grass or mixed-grass prairie plants. When occurring in lowland areas, they are often home to wet meadow species or may contain small wetlands. Sunlight passes easily through the canopy of healthy, mature aspen galleries, promoting understory growth of a rich variety of grasses, wildflowers and sometimes shrubs. In combination, this complex of trees, grasses and shrubs provide unique foods (including seeds, berries or nuts) for an equally diverse array of wildlife.

Woody Draws

Draws are prominent features across eastern Montana. A much drier, upland environment often surrounds these more diverse dry streambed type areas. Water is not present long enough each year in order to classify them as a wetlands but they are characterized by a greater diversity and density of vegetation that serves a similar function. Woody draws provide essential cover, food and water for many wildlife species in Eastern Montana that otherwise would not exist. The woody draws are ribbons of life throughout eastern Montana that support some of the highest concentrations of wildlife in the area. Information exists that indicates woody draws are declining throughout the Northern Great Plains (Lesica 2005). Conserving these draws will depend on the success of green ash, the dominant plant species in most stands.

Essential Associated Plant Community

Aspen (*Populus tremuloides*)
Basswood (*Tilia americana*)
Birch (*Betula spp.*)
Bur Oak (*Quercus macrocarpa*)
Green Ash (*Fraxinus pennsylvanica*)
Plains Cottonwood (*Populus deltoides*)

There are a total of 26 terrestrial vertebrate species that are found within the Mixed Broadleaf Forests Community Type, with 5 of these species being essentially associated. All associations can be found within Table 41.

Conservation Concerns

- Unsustainable grazing practices, clearing for agricultural use, and loss of habitat due to human population growth
- Altered natural fire regime
- Flood control and channelization through rip-rapping and other means
- Culverts, dams, irrigation diversions or other instream barriers that fully or partially impede movement of species and reduce connectivity of habitat
- Unsustainable harvest of older cottonwoods for lumber or pulp
- Encroachment by conifers and herbivory from wild and domestic herbivores on aspen galleries
- Unsustainable grazing by wild and domestic herbivores in woody draws

Conservation Strategies

- Re-establish fire regime in aspen galleries
- Woody draws should be managed to preserve mature trees and snags
- Work with agency or private land conservation efforts to place easements on, or implement for the most integral aspens found in forested and riparian habitats
- Work with landowners to improve grazing practices
- Maintain and recruit old growth trees for snags used by cavity nesting species
- Support initiatives to re-establish or maintain green ash in woody draws

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5163
5164

Mixed Shrub/Grass Associations (4,159,693 acres or 5.34% of Montana)

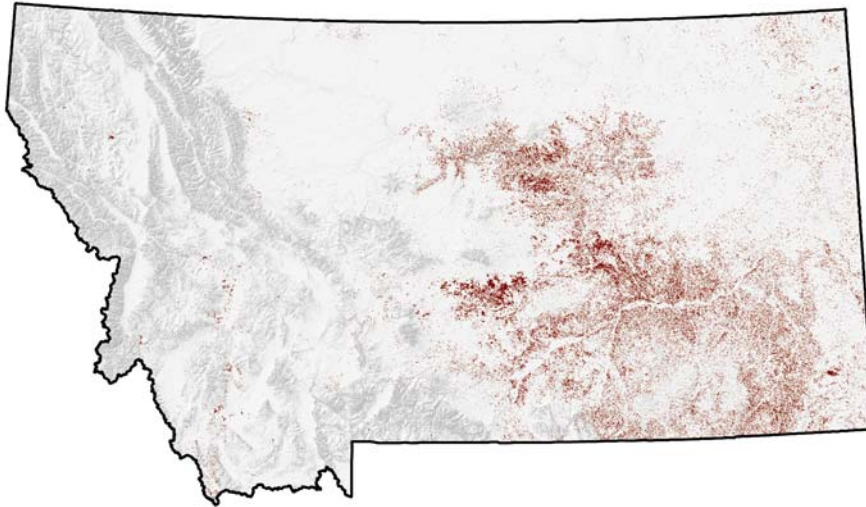


Figure 38. Distribution of Mixed Shrub/Grass Associations Community Types

The mixed shrub/grass associations community types include the shrub-dominated areas that also support grass. These types can be either moist (mesic) or dry (xeric) but usually occur at low elevation and often along lower slopes. These communities are the transition between pure shrub and grass communities and support a very unique assembly of associated species.

Mesic

Occurs primarily in central and eastern Montana valleys and along some low mountain slopes. Mesic shrub-grassland associations occur with codominance between the shrub and grass species. Shrub and grass cover ranges from 10-50%. It is found on moist sites usually between pure grass or shrub-dominated regions.

Essential Associated Plant Community

Grass

- Bluebunch Wheatgrass (*Agropyron spicatum*)
- Bluestem (*Andropogon spp.*)
- Fescue (*Festuca spp.*)
- Needle & Thread grass (*Stipa comata*)
- Threadleaf Sedge (*Carex filifolia*)
- Western Wheatgrass (*Agropyron smithii*)

Shrubs

- Buffalo Berry (*Shepherdia argentea*)
- Choke Cherry (*Prunus virginiana*)
- Silver Sage (*Artemisia cana*)
- Snowberry (*Symphoricarpos spp.*)
- Sumac (*Rhus spp.*)

Xeric

Occurs primarily in central and eastern Montana valleys and along some low mountain slopes. Xeric shrub-grassland associations occur with codominance between the shrub and grass species. Shrub and grass cover ranges from 10-50%. Found on dry sites in valleys and is usually between grass dominated and shrub dominated regions.

Essential Associated Plant Community

Grass

- Blue grama (*Bouteloua gracilis*)
- Bluebunch Wheatgrass (*Agropyron spicatum*)
- Bluestem (*Andropogon spp.*)
- Fescue (*Festuca spp.*)
- Needle & Thread grass (*Stipa comata*)
- Western Wheatgrass (*Agropyron smithii*)

Shrubs

- Rabbitbrush (*chrysothamnus spp.*)
- Sagebrush (*Artemisia spp.*)

Associated Species of Greatest Conservation Need

There are a total of 39 terrestrial vertebrate species that are found within the Mixed Shrub/Grass Associations Community Type, with 10 of these species being essentially associated. These species will be bolded to denote essentially associated. All associations can be found within Table 42.

Birds: Sage-grouse, Mountain Plover, and Burrowing Owl

Mammals: Spotted Bat and Black-tailed Prairie Dog

Reptiles: Western Hognose Snake and Milk Snake

Conservation Concerns

- Loss of habitat due to conversion of native habitat to agriculture or as a result of human population growth/development
- Invasive species and potential for spreading
- Unsustainable grazing practices & residual effects of herbicide spraying
- Oil, gas, coal, coalbed methane and geothermal development

Conservation Strategies

- Work with off-road vehicle users to help reduce spread of invasive weeds
- Promote grazing plans that encourage a mosaic of sagebrush, native grasses and forbs
- Create a stable native seed source for sage grasslands restoration after fires
- Support private land easements that protect natural habitat to provide large blocks of a diverse mosaic of habitats
- Incentives and education for private landowners to protect natural habitat
- Monitor leasing and development decisions and regulations applying to geophysical exploration

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- Casey, D. 2000. Partners in Flight Bird Conservation Plan Montana Version 1.0. Montana Partners in Flight. Kalispell, Montana.
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Wetland & Riparian (3,724,224 acres or 3.94% of Montana)

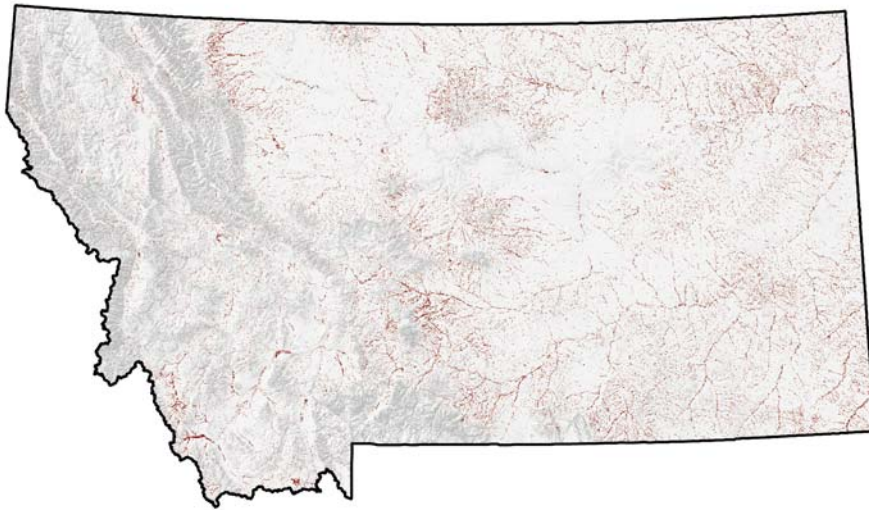


Figure 39. Distribution of Wetland and Riparian Community Types

Montana's riparian and wetland communities vary widely depending on the area of the state and elevation where they are located, but generally they represent the green zones along, rivers, streams, lakes and reservoirs and include potholes, wet meadows, marshes and bogs. This community type also includes the cottonwood forests that occur throughout Montana. Cottonwood stands develop in river and stream corridors on alluvial bars created by dynamic flows of spring run-off and mature into forests that eventually alter the direction of water flow. These stands, including Great Plains or Black cottonwoods, help stabilize banks, keep waters cool in summer, and their associated plants support diverse wildlife species. As a result of the adjacent water and diverse vegetation, these communities support the greatest concentration of plants and animals in Montana and serve as a unique transition zone between the aquatic and the terrestrial environments.

Riparian and wetland communities often occur as narrow linear bands or small depressions that are not recognized at the scale of the GAP mapping used in this analysis. More accurate and inclusive knowledge of riparian/wetland locations and types will be available if National Wetlands Inventory mapping or a similar product is completed for Montana. These types of efforts should be supported in order to improve future revisions of this Strategy.

Conifer Riparian

Occurs in riparian areas in western and south-central Montana. Riparian areas dominated by conifer forest, with total tree cover from 20-100%. Associated shrub species: alder (*Alnus spp*), red-osier dogwood (*cornus stolonifera*), bunchberry (*Cornus canadensis*), willows (*Salix spp.*), thimbleberry (*Rubus*

parviflorum), twin flower (*Linnaea borealis*). Associated grass and forb species: queens cup beadleily (*Clintonia uniflora*).

Essential Associated Plant Community

Douglas-fir (*Pseudotsuga menziesii*)
Engelmann Spruce (*Picea engelmannii*)
Grand Fir (*Abies grandis*)
Red-osier Dogwood (*Cornus stolonifera*)
Subalpine Fir (*Abies lasiocarpa*)
Western Hemlock (*Tsuga heterophylla*)
Western Red Cedar (*Thuja plicata*)

Broadleaf Riparian

Occurs in riparian areas across Montana. Riparian areas dominated by broadleaf (cottonwood) forest, with total tree cover from 20-100%. Associated shrub species: alder (*Alnus spp*), bunchberry (*Cornus canadensis*), serviceberry (*Amelanchier alnifolia*), thimbleberry (*Rubus parviflorum*), common chokecherry (*Prunus virginiana*), and willow (*Salix spp*). Associated grass and forb species: queens cup beadleily (*Clintonia uniflora*), carex (*Carex spp*). Mixed

Essential Associated Plant Community

Aspen (*Populus tremuloides*)
Basswood (*Tilia americana*)
Birch (*Betula spp.*)
Black Cottonwood (*Populus trichocarpa*)
Bur Oak (*Quercus macrocarpa*)
Green Ash (*Fraxinus pennsylvanica*)
Plains Cottonwood (*Populus deltoides*)

Broadleaf & Conifer Riparian

Occurs in riparian areas in western and south-central Montana. Riparian areas dominated by mixed broadleaf (cottonwood) and conifer forest, with total tree cover from 20-100%. Associated shrub species: alder (*Alnus spp*), bunchberry (*Cornus canadensis*), serviceberry (*Amelanchier alnifolia*), thimbleberry (*Rubus parviflorum*) and willow (*Salix spp*). Associated grass and forb species: queens cup beadleily (*Clintonia uniflora*), carex (*Carex spp*).

Essential Associated Plant Community

Aspen (*Populus tremuloides*)
Birch (*Betula spp.*)
Black Cottonwood (*Populus trichocarpa*)

- 5352 Grand Fir (*Abies grandis*)
- 5353 Douglas-fir (*Pseudotsuga menziesii*)
- 5354 Engelmann Spruce (*Picea engelmannii*)
- 5355 Subalpine Fir (*Abies lasiocarpa*)
- 5356 Western Larch (*Larix occidentalis*)
- 5357 Western Hemlock (*Tsuga heterophylla*)
- 5358 Western Red Cedar (*Thuja plicata*)

5359

5360 **Graminoid & Forb Riparian**

5361

5362 Occurs in riparian areas across the state. Riparian areas dominated by
5363 herbaceous species, with total herbaceous cover 30-100%. Riparian areas with
5364 tree and shrub cover less than 15%. Standing water may be present in the
5365 riparian area (cattail marshes).

5366

5367 **Essential Associated Plant Community**

5368

- 5369 Baltic Rush (*Juncus balticus*)
- 5370 Bluejoint Reedgrass (*Calamagrostis canadensis*)
- 5371 Bog Sedge (*Carex rostrata*)
- 5372 Cinquefoil (*Potentilla spp*)
- 5373 Cattails (*Typha spp*)
- 5374 Lake Sedge (*Carex lacustris*)
- 5375 Maritime Sedge (*Carex incurviformis*)
- 5376 Northern Reedgrass (*Calamagrostis inexpensa*)
- 5377 Rushes (*Juncus spp*)
- 5378 Saxifrage (*Saxifraga spp*)
- 5379 Sedges (*Carex spp*)
- 5380 Tufted Hairgrass (*Deschampsia cespitosa*)

5381

5382 **Shrub Riparian**

5383

5384 Occurs in riparian areas across the state. Riparian areas dominated by shrubs,
5385 with total shrub cover from 20-100%. Tree cover is less than 15% and shrubs
5386 dominate over the herbaceous species. Standing water may be present in the
5387 riparian area (willow marshes).

5388

5389 **Essential Associated Plant Community**

5390

- 5391 Alder (*Alnus spp*)
- 5392 Black Hawthorn (*Crataegus douglasii*)
- 5393 Bog Birch (*Betula glandulosa*)
- 5394 Choke Cherry (*Prunus virginiana*)
- 5395 Currant (*Ribes spp*)
- 5396 Red-osier Dogwood (*Corus stolonifera*)
- 5397 Rose (*Rosa spp*)

5398 Shrubby Cinquefoil (*Potentilla fruticosa*)
5399 Silver Sage (*Artemisia cana*)
5400 Snowberry (*Symphoricarpos spp*)
5401 Thimbleberry (*Rubus parviflorum*)
5402 Twin-berry (*Lonicera involucrata*)
5403 Utah Honeysuckle (*Lonicera spp*)
5404 Water Birch (*Betula occidentalis*)
5405 Willows (*Salix spp*)

5406

5407 **Mixed Riparian**

5408

5409 Occurs in riparian areas across the state. Riparian areas dominated by a mix of
5410 shrub and herbaceous species, with codominance of shrub and grass species
5411 present. Tree cover is less than 15%.

5412

5413 **Essential Associated Plant Community**

5414

5415 Grass species (see *Graminoid & Forb Riparian species*)

5416 Shrub species (see *Shrub Riparian species*)

5417

5418 **Associated Species of Greatest Conservation Need**

5419

5420 There are a total of 265 terrestrial vertebrate species that are found within the
5421 Riparian & Wetlands Community Type, with 193 of these species being
5422 essentially associated. These species will be bolded to denote essentially
5423 associated. All associations can be found within Table 43.

5424

5425 **Amphibians: Coeur D'Alene Salamander, Boreal Toad and Northern**
5426 **Leopard Frog**

5427

5428 **Birds: Common Loon, Trumpeter Swan, Harlequin Duck, Bald Eagle, Yellow**
5429 **Rail, Piping Plover, Least Tern, Black Tern, Sedge Wren, and Nelson's**
5430 **Sharp-tailed Sparrow**

5431

5432 **Mammals: Townsend's Big-eared Bat, Pygmy Rabbit, Northern Bog Lemming,**
5433 **and Meadow Jumping Mouse**

5434

5435 Reptiles: Snapping Turtle, Spiny Softshell, and Western Hognose Snake

5436

5437 **Conservation Concerns**

5438

- 5439 • Draining and conversion of wetlands to agricultural cropland or
- 5440 subdivisions
- 5441 • Degradation of uplands due to unsustainable grazing or industrial use
- 5442 • Contaminated runoff from agriculture in wetlands & riparian areas
- 5443 • Invasion by exotic plants
- 5444 • Unmanaged heavy recreational use of wetlands and rivers

- Dams, channelization, and rip-rapping for flood and erosion control disrupt natural stream dynamics, affecting successional patterns
- Loss of shrub layers and lack of overstory recruitment due to persistent wild and domestic grazing pressures in woody draws
- Loss of streambank stability
- Habitat loss due to human population growth

Conservation Strategies

- Work with other groups to identify wetlands that are critically important to wildlife diversity and work towards protection and enhancement
- Work with local governments and organizations to address loss of riparian and wetland areas associated with residential development through setbacks and other means
- Work with landowners or reservoir operators to provide water levels compatible with natural regimes
- Identify opportunities to provide the high flows needed for channel diversity, gravel bar development, and cottonwood regeneration along each of the major river drainages in the state
- Manage grazing and recreational uses along riparian areas and promote streambank stability
- Protect snags and mature trees in riparian systems wherever possible
- Increased management for sustainable recreational

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5495

5496

Sagebrush and Salt Flats (5,625,886 acres or 5.97% of Montana)

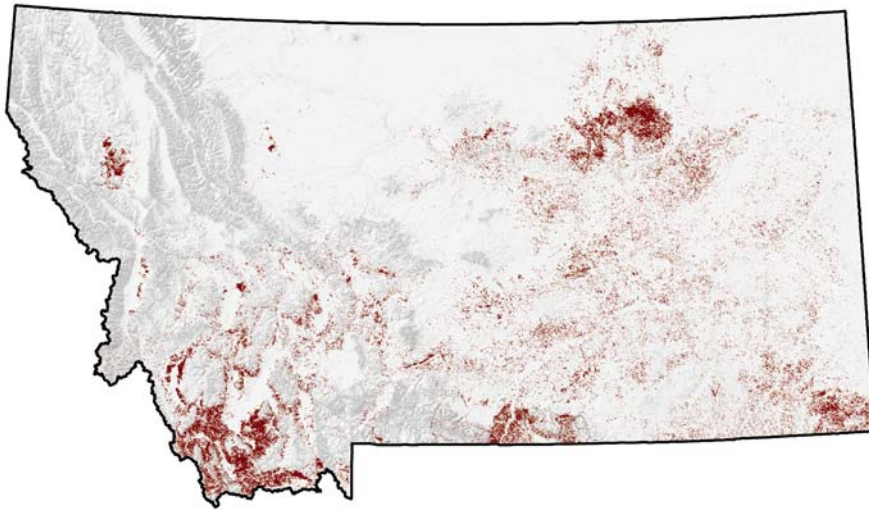


Figure 40. Distribution of Sagebrush and Salt Flats Community Types

The sagebrush community includes all sagebrush and their associated grass and shrubs although specific attention should be focused on the “shrub steppe” that is a transitional zone between arid shrubland and semiarid grassland and saltsage that occurs primarily in eastern and southeastern Montana alkalia flats. The community can be visualized as a mosaic of sagebrush communities that occur in discontinuous pockets throughout Montana but mostly in the eastern two thirds.

These communities occur across the state, primarily in valleys. Occasionally occur on low-mid elevation mountain slopes. Shrublands are dominated by sagebrush (*Artemisia* spp.) with 20-80% cover.

Essential Associated Plant Community

- Basin Big Sagebrush (*Artemisia tridentate tridentata*)
- Black Sagebrush Steppe (*Artemisia nova*)
- Mountain Big Sage (*Artemisia tridentate vaseyana*)
- Wyoming Big Sage (*Artemisia tridentate wyomingensis*)
- Saltsage (*Atriplex nuttallii*)

Associated Species of Greatest Conservation Need

There are a total of 81 terrestrial vertebrate species that are found within the Sagebrush and Salt Flats Community Type, with 23 of these species being essentially associated. These species will be bolded to denote essentially associated. All associations can be found within Table 44.

Birds: Sage-grouse, Mountain Plover, Long-billed Curlew, and **Burrowing Owl**

Mammals: Spotted Bat, Pallid Bat, Pygmy Rabbit, Great Basin Pocket Mouse, Black-tailed prairie dog, and **White-tailed Prairie Dog**

Reptiles: Snapping Turtle, Western Hognose Snake, and Milk Snake

Conservation Concerns

- Unsustainable grazing practices, conversion to agriculture, have altered the distribution and condition of Montana's sagebrush shrublands
- Invasion of weeds, woody and nonnative species
- Loss of sagebrush as result of human population growth/development
- Oil, gas, and geothermal exploration and development
- Unsustainable grazing practices

Conservation Strategies

- Protect large blocks of healthy big sagebrush
- Work with off-road vehicles users to help reduce spread of invasive weeds
- Work with private landowners through land owner incentives and conservation easements to protect critical habitats
- Promote grazing plans that encourage a mosaic of sagebrush, native grasses and forbs
- Create a stable native seed source for sage grasslands restoration after fires
- Monitor leasing and development decisions and regulations applying to geophysical exploration

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Mountains Streams (59,364 Stream Miles in Montana)

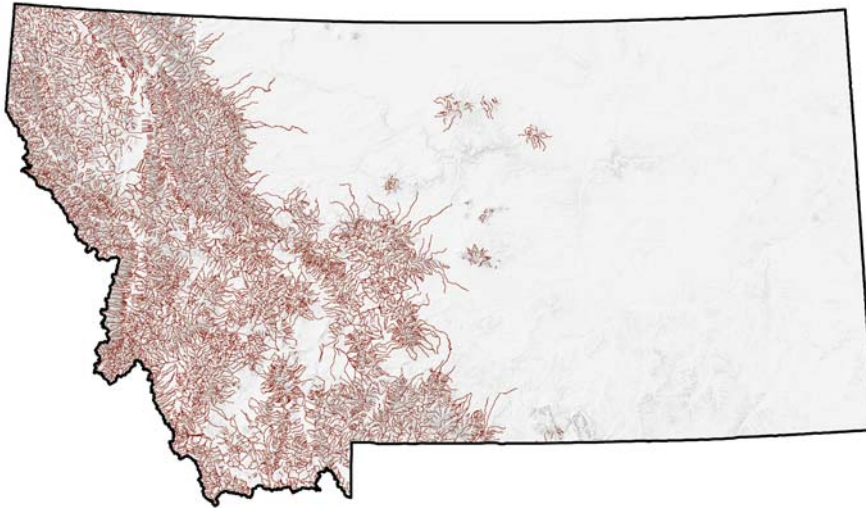


Figure 41. Distribution of Mountain Stream Community Types

Mountain streams of western Montana are typically cold and clear serving as the headwaters for all major river systems in Montana. Mountain streams often flow through montane conifer forests beginning at the highest elevations, and can be as diverse as high-alpine, steep gradient reaches to low-gradient, meadow stream types (Stagliano 2005). These streams are home to abundant native fish species and are the targets of trout fisherman from around the country. Many of these native fish are declining due to habitat degradation, dams, hybridization, overfishing, and being outcompeted by introduced salmonids. These streams support the remaining genetically pure stocks of Montana's Yellowstone and Westslope cutthroat and Bull trout.

Essential Associated Plant Community

This information has not been defined for the mountain stream community type.

Associated Species of Greatest Conservation Need

There are a total of 18 fish, mussel and crayfish species that are found within the Mountain Streams Community Type, with 17 of these species being essentially associated. These species will be bolded to denote essentially associated. All associations can be found within Table 45.

Invertebrates: **Western Pearlshell**

Fish: **Yellowstone Cutthroat Trout, Westslope Cutthroat Trout, Columbia Basin Redband Trout, Bull Trout, and Arctic Grayling**

Conservation Concerns

- Riparian degradation from roads, housing development, mining and unsustainable domestic livestock grazing practices that degrade the adjacent riparian habitat and stream channel
- Stream dewatering
- Entrainment of fish in irrigation diversions
- Stream channel alteration
- Introductions of non-native fishes

Conservation Strategies

- Support grazing techniques that improve riparian vegetation
- Increasing In-stream flows through water leasing and water conservation measures
- Placing fish screens across diversions
- Protection of native species through habitat protection and enhancement , controlling and in some cases removing non-native species, restoring or introducing native fishes into suitable waters

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Prairie Streams (91,189 Stream Miles in Montana)



Figure 42. Distribution of Prairie Stream Community Types

There are at least 18,000 miles of prairie streams in Montana that have water either intermittently or permanently flowing through them in an otherwise dry region. Eight specific types of prairie streams were scientifically delineated for Montana (Stagliano 2005). These low elevation streams east of the Rocky Mountains are warmer than their counterparts in western Montana and support a richer and quite different variety of fish. Stagliano (2005) also documented 9 fish species group assemblages (SPA's) or community associations for the prairie stream systems. Many of these streams are slow moving, sometimes turbid and weedy, while those in the Northern Glaciated Plains can be just as clear as a mountain stream. They offer good rearing habitat for associated fish species and support many amphibians and reptiles and are crucial for populations of terrestrial wildlife.

Essential Associated Plant Community

This information has not been defined for prairie the stream community type.

Associated Species of Greatest Conservation Need

There are a total of 32 aquatic species that are found within the Prairie Streams Community Type, with 25 of these species being essentially associated. These species will be bolded to denote essentially associated. All associations can be found within Table 46.

Fish: Pearl Dace

Conservation Concerns

- Degredation of riparian habitat from unsustainable domestic livestock practices
- Stream diversions and dewatering
- Poorly understood impacts of petroleum exploration and extraction
- Introductions of non-native fishes

Conservation Strategies

- Support management of grazing that maintains riparian vegetation and streambank and channel stability in excellent condition
- Place fish screens across diversions
- In-stream flow augmentation
- Increase exploration and scientific studies on impacts of Coal-bed methane on aquatic environments
- Non-native removal in selective and appropriate locations

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Component III: Species of Greatest Conservation Need

“These are species whose needs must be specifically addressed, whether through focus areas, community types or individually”

Conservation efforts at the landscape and community scales offer great potential to leverage resources in order to benefit multiple species. However, some species are too specialized for broad-scale conservation efforts to do much good, or populations have declined to the point where it requires individually focused conservation. For these reasons the conservation concerns and needs range from survey and monitoring or reintroduction to landscape level habitat restoration or protection. Fish, Wildlife & Parks has a clear obligation to use its resources and work with partners to conserve Tier I species, regardless of the scale of conservation strategies identified.

All vertebrate species as well as mussels and crayfish were assessed for conservation need. Invertebrates were not included in the assessment due to lack of data. The need for data about invertebrates has been addressed in the Inventory Component of this Strategy. A complete list of species Tier assignments can be found in Table 3.

Invertebrates

During the initial planning stages, the FWP Technical and Steering Committees determined that the Strategy would not include Montana’s invertebrate species. With nearly 1,000 species of aquatic invertebrates in the state, and at least twice that number of terrestrial invertebrates, it is impossible at this time to develop a Strategy to comprehensively address invertebrate conservation in Montana. It was decided to include mussels and crayfish.

Mussels

Western Pearlshell (*Margaritifera falcata*)

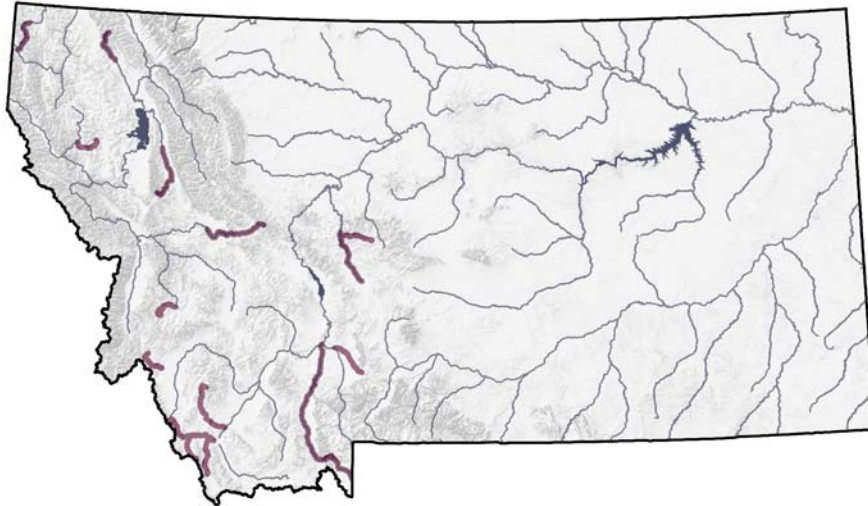


Figure 43. Distribution of the Western Pearlshell Mussel

Range

This is a headwater species occurring very near the Continental Divide in trout streams and rivers west of the Divide and in Missouri River headwaters. This species occurs in sand, gravel and even between cobble and boulders. Outside of Montana this species is reported from the Pacific drainage from southern Alaska to central California. It does not seem to occur anywhere in the central part of the continent.

Habitat

The normal fish hosts in our area are probably *Oncorhynchus* species, but *Salmo* and *Salvelinus* and even *Rhinichthys* and *Catostomus* are reported to be suitable. They likely crossed the divide with the west-slope cutthroat trout, which is the native salmonid of the upper Missouri River drainage. This species occurs in sand, gravel and even between cobble and boulders.

Management

Mussels are a regulated species but a better understanding of mussel distribution throughout the state is needed.

Conservation Concerns

- Habitat degradation and fragmentation (e.g., dams, stream channelization, diversions, dredging and dewatering)

- Point and nonpoint source pollution
- Stream deterioration because of high sediment loads, chiefly from agricultural runoff
- Threats to host fish also jeopardize mussel survival
- Reduced dissolved oxygen content in water

Conservation Strategies

- Consider preparing a management plan for Western Pearlshell or its inclusion into other comprehensive taxonomic management plan
- Enforcement of regulations that address the dumping of pollutants into waterways
- Restore connectivity of habitat, and manage for healthy populations native fish including cutthroat trout and bull trout

Management Plan

None

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Vertebrates

There are 636 vertebrate species that have been documented in Montana. Sixty of these were determined to be Tier I (greatest need of conservation), 143 Tier II (moderate conservation need), 281 Tier III (lower conservation need), and 152 species that were classified as Tier IV (non-native, peripheral).

Amphibians

Coeur d'Alene Salamander (*Plethodon idahoensis*)

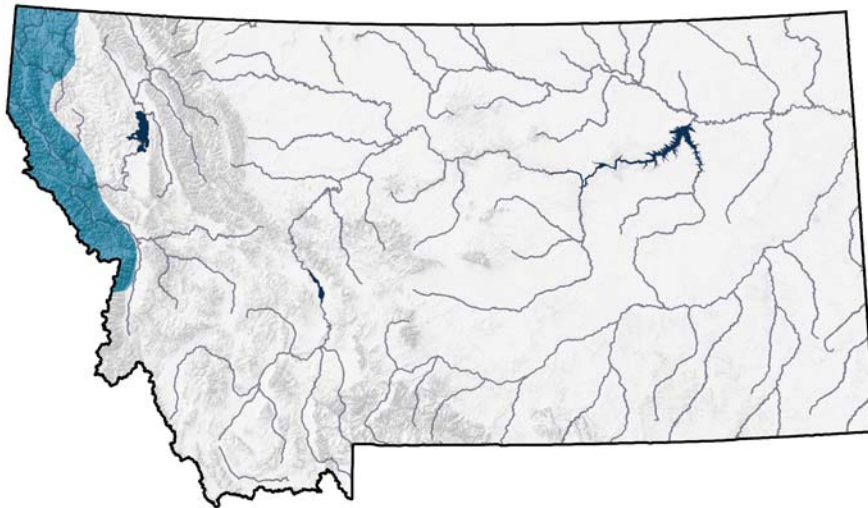


Figure 44. Distribution of the Coeur d'Alene Salamander

Range

This salamander is a regional endemic for which Montana is the eastern limit in distribution. In Montana, the Coeur d'Alene salamander is known from about 45 locations in five northwestern counties: Lincoln, Sanders, Mineral, Missoula, and Ravalli. The southern limit of known distribution is Lake Como Falls in the Bitterroot River drainage (Maxell 2002) and the northernmost population is along the South Fork of the Yaak River (Wilson and Simon 1987, Maxell et al. 2003). Maximum known elevation is 5000 feet (1524 meters).

The Coeur d'Alene salamander has been the subject of taxonomic controversy nearly since its initial discovery. First classified as a new species (Slater and Slipp 1940) it was later reclassified (Lowe 1950) as a subspecies of the Van dyke salamander (*Plethodon vandykei idahoensis*) found in western Washington. Evidence to support its designation as a species it is still being debated in the taxonomy world. Whether considered a species or a subspecies, the Coeur d'Alene salamander represents a unique genetic resource in Idaho, Montana,

and British Columbia and should be managed as such (Howard 1993). The Coeur d'Alene salamander has a small range in northern Idaho, western Montana, and southeastern British Columbia. It is found in close association with water in springs or seeps, spray zones of waterfalls, and edges of streams, and feeds on aquatic insects. Coeur d'Alene salamanders tend to have small home ranges, are strongly philopatric, and show no tendency to disperse away from home ranges when disturbed (Petranka et al. 1993).

The Coeur d'Alene salamander is rare and local, distributed in suitable habitat (Werner and Reichel 1994) and in Montana is reported in Lincoln, Sanders, Mineral, Missoula, and Ravalli Counties. The core of distribution and area of greatest density of known locations is in the northern Idaho drainages of the St. Joe, North Fork Clearwater, and Coeur d'Alene Rivers in Idaho (Groves 1989), but the species distribution does extend northward along the Moyie River drainage into British Columbia, Canada (Wilson et al. 1989). Known from Benewah, Bonner, Boundary, Clearwater, Idaho, Kootenai, Latah, and Shoshone counties in Idaho (Groves and Petersen 1992).

Habitat

The habitat for Coeur d'Alene salamanders includes the three major habitat categories: springs and seeps, waterfall spray zones, and stream edges (Wilson and Larsen 1988, Werner and Reichel 1994, Boundy 2001, Maxell 2002). Specific primary habitats are seeintermountain/foothill grassland and streamside talus, but they also inhabit talus far from free water (deep talus mixed with moist soil on well-shaded north-facing slopes). Coeur d'Alene salamander occurrences are generally located in coniferous forests, but are not restricted to a particular overstory species or aspect. In wet weather, they also occur in leaf litter and under bark and logs in coniferous forests.

All plethodontid salamanders respire through their skin; terrestrial species lose water to the environment through evaporation and are therefore restricted to cool, damp environments. Coeur d'Alene salamanders are closely tied to water and are considered among the most aquatic plethodontids (Brodie and Storm 1970). Because they may live in the harshest climate of any northwestern plethodontid (Nussbaum et al. 1983), they are highly dependent on the thermal and hydrologic stability provided by wet habitats in otherwise inhospitable surroundings.

Sites occupied by Coeur d'Alene salamanders in Montana have fractured rock formation present and nearby habitat are typically forested (Reichel and Flath 1995). Foraging areas include seepage areas and splash zones with high humidity, high substrate moisture, and relatively high temperatures (Wilson and Larsen 1988). Shelter is provided by deep bedrock fractures or in talus habitat populations, underground (Wilson and Larsen 1988). Montana populations are found primarily in talus areas along splash zones of creeks, or with seeps

running through (Teberg 1963, 1965; Wilson and Larsen 1988). Idaho and Montana populations breed in both spring and fall, although most eggs usually are laid in the spring. Eggs are laid in moist, concealed places on land (Stebbins 1985) far down in the rocks (Werner and Reichel 1994). Generally found in moist talus, seeps and splash zones. These may be situated in open forests, meadows, or riparian areas (Groves et al. 1996).

Management

Potential threats for the species across its global range apply also to Montana populations, but population declines or extinctions have not yet been documented here. Some populations continue to be vulnerable to highway construction activity, and most occur at elevations and in forest types where timber harvest is a common activity. Routine monitoring (Groves et al. 1996) of known populations should be conducted to identify threats to each, as well as to determine their continued viability.

Conservation Concerns

- Disturbances, such as timber harvest, fire, road and trail construction, and water diversion projects
- Pollution
- Introduction of exotic species
- Restricted mobility coupled with increasing habitat fragmentation make it susceptible to local extirpation
- Disease and parasites
- Global change (climatic and atmospheric changes such as increased UV-B radiation, pollution, acid rain, and disease)

Conservation Strategies

- Surveys of potential habitats for the Coeur d'Alene salamander
- Monitoring of known locales
- Habitat protection and conservation through regulation of development, logging, and chemical applications
- Avoid road construction within 300 feet
- Fence known salamander sites to exclude livestock
- To prevent spread of chytrid fungus, personnel working in either lentic or lotic systems should thoroughly rinse and decontaminate all equipment as described in Maxell et al (2004)
- Regulate chemical application (herbicides, pesticides, fertilizers etc.) within 300 feet of water bodies or wetlands

Management Plan

Maxell, Bryce A., 2000, Management of Montana's amphibians: A Review of factors that may present a risk to population viability and accounts on the identification, distribution, taxonomy, habitat use, natural history and the status and conservation of individual species. Contract No. 43-0343-0-0224. September 20, 2000.

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Boreal Toad (*Bufo boreas*)

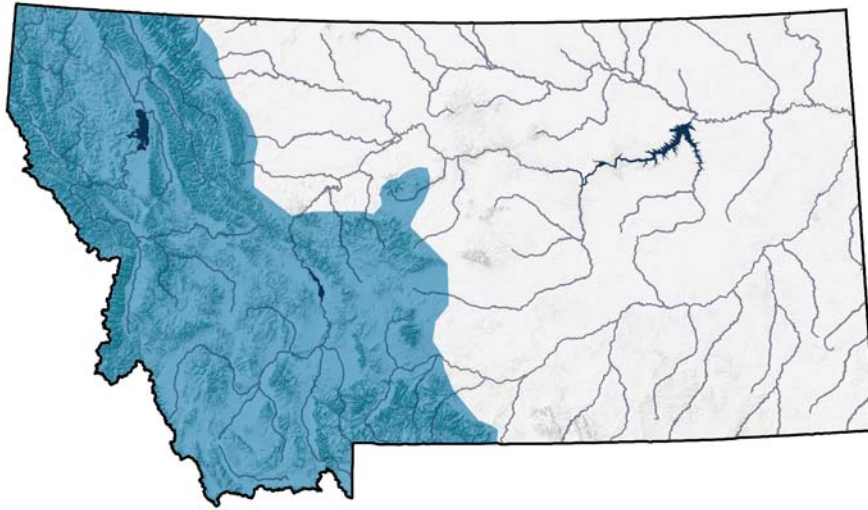


Figure 45. Distribution of the Boreal Toad

Range

The boreal toad is found throughout the mountains and intermountain valleys of the western third of the state on both sides of the Continental Divide (Maxell et al. 2003). Specimens have been collected in 22 western counties and sighted in five more, at elevations up to 9220 feet (2810 meters).

Habitat

Habitats used by boreal toads in Montana are similar to those reported for other regions, and include low elevation beaver ponds, reservoirs, streams, marshes, lake shores, potholes, wet meadows, and marshes, to high elevation ponds, fens, and tarns at or near tree line (Rodgers and Jellison 1942, Brunson and Demaree 1951, Miller 1978, Marnell 1997, Werner et al. 1998, Boundy 2001). Forest cover in or near encounter sites is often unreported, but toads have been noted in open-canopy ponderosa pine woodlands and closed-canopy dry conifer forest in Sanders County (Boundy 2001), willow wetland thickets and aspen stands bordering Engelmann spruce stands in Beaverhead County (Jean et al. 2002), and mixed ponderosa pine/cottonwood/willow sites or Douglas-fir/ponderosa pine forest in Ravalli and Missoula counties (P. Hendricks personal observation).

Elsewhere the boreal toad is known to utilize a wide variety of habitats, including desert springs and streams, meadows and woodlands, mountain wetlands, beaver ponds, marshes, ditches, and backwater channels of rivers where they prefer shallow areas with mud bottoms (Nussbaum et al. 1983, Baxter and Stone 1985, Russell and Bauer 1993, Koch and Peterson 1995, Hammerson 1999).

Forest cover around occupied montane wetlands may include aspen, Douglas fir, lodgepole pine, Engelmann spruce, and subalpine fir; in local situations it may also be found in ponderosa pine forest. They also occur in urban settings, sometimes congregating under streetlights at night to feed on insects (Hammerson 1999, P. Hendricks personal observation). Normally they remain fairly close to ponds, lakes, reservoirs, and slow-moving rivers and streams during the day, but may range widely at night. Eggs and larvae develop in still, shallow areas of ponds, lakes, or reservoirs or in pools of slow-moving streams, often where there is sparse emergent vegetation. Adult and juvenile boreal toads dig burrows in loose soil or use burrows of small mammals, or occupy shallow shelters under logs or rocks. At least some toads hibernate in terrestrial burrows or cavities, apparently where conditions prevent freezing (Nussbaum et al. 1983, Koch and Peterson 1995, Hammerson 1999).

Management

The boreal toad was considered the most abundant amphibian of the western third of the state in previous decades (Rodgers and Jellison 1942, Brunson 1952, Maxell 2003), and is still encountered widely and frequently though by no means commonly, and is no longer ranked as the most abundant amphibian. Numerous surveys since the early 1990s indicate that this species has experienced regional population declines in the state. Boreal toads were documented to breed at only 2 to 5% of more than 2000 standing water bodies surveyed since 1997, and where breeding was documented, fewer than 10 breeding females contributed in a given year (Maxell 2000, Maxell et al. 2003). Range wide declines in this species have been indicated in Montana, as well as other western states.

Conservation Concerns

- Breeding site destruction
- Diseases such as red-leg disease and chytrid fungus
- Use of chemicals and fertilizers
- Increased predation by species attracted to human disturbance

Conservation Strategies

- Protect certain wetlands occupied by boreal toads from introduced species and human disturbance
- Survey wetlands suitable for boreal toads
- Reduce access by livestock to known breeding sites within grazing allotments which will prevent undue trampling mortality (Bartelt 1998).
- Avoid stocking of predatory game fish at sites lacking them
- Avoid use of pesticides, fertilizers and herbicides near known breeding areas

Management Plan

Maxell, Bryce A., 2000, Management of Montana's amphibians: A Review of factors that may present a risk to population viability and accounts on the identification, distribution, taxonomy, habitat use, natural history and the status and conservation of individual species. Contract No. 43-0343-0-0224. September 20, 2000.

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Northern Leopard Frog (*Rana pipiens*)

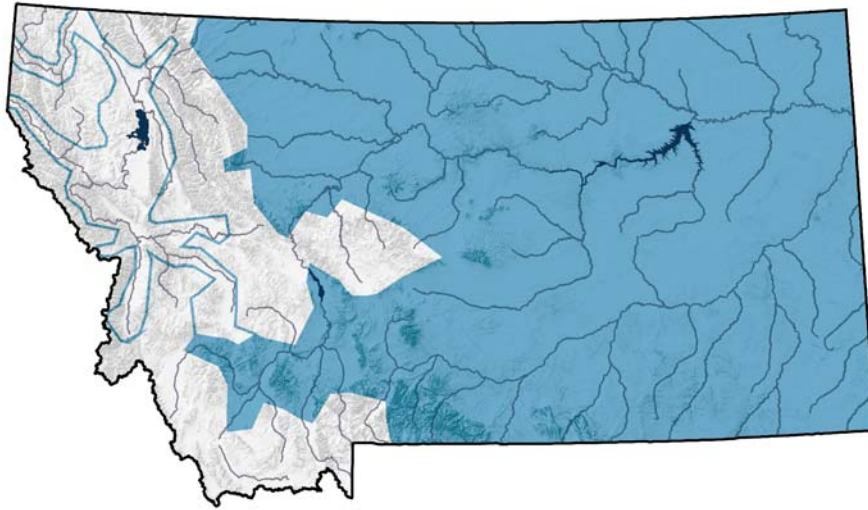


Figure 46. Distribution of the Northern Leopard Frog

Range

The northern leopard frog is found across the prairie regions of the eastern two-thirds of Montana east of the Continental Divide (Maxell et al. 2003). It was formerly present in intermountain valleys west of the Continental Divide, especially in the Flathead and lower Clark Fork river drainages, but in recent years has been documented at only two western sites (Werner 2003): near Kalispell (Flathead County) and near Eureka (Lincoln County). This frog has been documented in all but seven Montana counties (six of which are west of the Continental Divide), at elevations up to 6700 feet (2042 meters).

The northern leopard frog historic distribution is irregular but includes western Montana except in the Big Hole area, as well as the tip of Idaho Panhandle and southeast and parts of southwest Idaho (Stebbins 1985). Recent extirpations are reported in all of western Montana and across much of the neighboring states (Werner and Reichel 1994, Reichel and Flath 1995). Known from Ada, Adam, Bear Lake, Bingham, Blaine, Boise, Bonner, Bonneville, Canyon, Caribou, Cassia, Clearwater, Custer, Elmore, Franklin, Fremont, Gem, Gooding, Jefferson, Jerome, Latah, Lincoln, Madison, Minidoka, Owyhee, Power, Teton, Twin Falls, Valley, and Washington counties in Idaho (Groves and Peterson, 1992).

Habitat

Habitats used by northern leopard frog in Montana include low elevation and valley bottom ponds, spillway ponds, beaver ponds, stock reservoirs, lakes, creeks, pools in intermittent streams, warm water springs, potholes, and marshes

(Brunson and Demaree 1951, Mosimann and Rabb 1952, Black 1969, Miller 1978, Dood 1980, Reichel 1995, Hendricks and Reichel 1996, Hendricks 1999). Northern leopard frogs require a mosaic of habitats to meet annual requirements of all life stages. They occupy a variety of wetland habitats of relatively fresh water with moderate salinity, including springs, slow streams, marshes, bogs, ponds, canals, flood plains, beaver ponds, reservoirs, and lakes, usually in permanent water with rooted aquatic vegetation. Adults and juveniles commonly feed in open or semi-open wet meadows and fields with shorter vegetation, usually near the margins of water bodies where there is permanent water and growth of cattails or other aquatic vegetation, yet may forage far from water in damp meadows (Stebbins 1985). They seek cover underwater and denser vegetation seems to be avoided.

Northern Leopard Frogs have a large range throughout much of the U.S. and southern Canada (NatureServe 2004) and are still common in many areas and in a wide array of pristine and disturbed habitats (NatureServe 2004). NatureServe (2004) lists northern leopard frog in 35 states in the U.S. and 12 Canadian provinces. Populations have declined in some areas due to habitat loss and degradation, overexploitation, interactions with non-native species, and unknown causes, but the overall status remains essentially undiminished (NatureServe 2004). In Montana the northern leopard frog is found primarily in riparian habitat but is not as restricted to water as other *Rana* species (Black 1969, Miller 1978). This species is abundant on plains near permanent water (Black 1969, Mosimann and Rabb 1952), tends to avoid tall, dense grass areas (Miller 1978) and prefers densely vegetated areas such as wet sedge meadows or cattail marshes (Reichel and Flath 1995, Werner and Reichel 1994).

Management

No special management needs are currently recognized for populations in eastern Montana. However, at permanent and semi-permanent water bodies (reservoirs and stock ponds) where breeding has been observed, portions of shorelines where emergent vegetation is present or might develop could be fenced to exclude access by livestock and thereby protect breeding adults, eggs and tadpoles from trampling and the removal of emergent cover. Another option would be the creation of ponds designed for use by prairie amphibians as breeding sites, with the perimeter surrounded by fencing to prevent access by livestock. Game fish should not be introduced to any of these ponds, nor should chemical fertilizers, pesticides and herbicides be used within 100 meters of the shoreline. All breeding sites west of the Continental Divide should be protected from livestock, and organic and chemical (pesticide and herbicide) contamination. Game fish and bullfrogs should not be introduced to these sites. Care should be taken to avoid introducing parasites and fungal, bacterial, and viral pathogens when monitoring these sites (see suggestions in Maxell 2000, Maxell et al. 2003). Any populations discovered in the western region should be reported to the Native Species Biologist of the Montana

Department of Fish, Wildlife & Parks or the Program Zoologist of the Montana Natural Heritage Program.

Conservation Concerns

- Loss of wetlands and hydrological regimes, drought
- Introduction of game fish, mosquitofish and bullfrogs
- Contamination by pesticides and herbicides
- Pathogens, including chytrid fungus (*Batrachochytrium dendrobatidis*)
- Global change (climatic and atmospheric changes such as increased UV-B radiation, pollution, acid rain, and disease).
- Unsustainable use and illegal collecting

Conservation Strategies

- Protect the two remaining breeding populations west of the continental divide in Montana
- Monitor historic breeding sites and populations
- Increase understanding of demographic vital rates, including the effects of the concerns listed above
- Habitat conservation and improvement projects
- Protect breeding sites from organic and chemical (pesticide and herbicide) contamination
- Protect breeding sites from livestock impacts
- To prevent spread of chytrid fungus, personnel working in either lentic or lotic systems should thoroughly rinse and decontaminate all equipment as described in Maxell et al 2004 (unpublished)
- Allow no introduction of game fish or bullfrogs into waters with known breeding

Management Plan

Maxell, Bryce A., 2000, Management of Montana's amphibians: A Review of factors that may present a risk to population viability and accounts on the identification, distribution, taxonomy, habitat use, natural history and the status and conservation of individual species. Contract No. 43-0343-0-0224. September 20, 2000.

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Reptiles

Snapping Turtle (*Chelydra serpentina*)

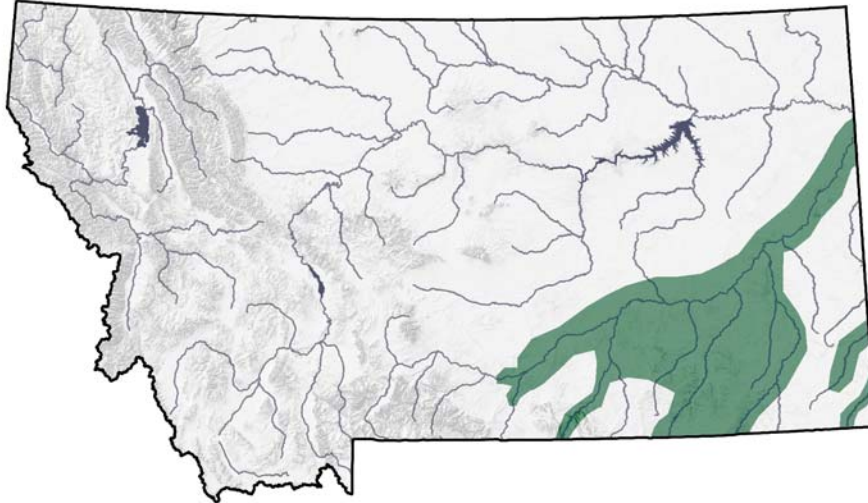


Figure 47. Distribution of the Snapping Turtle

Range

Voucher specimens have been collected in three eastern counties (Carter, Powder River, and Rosebud), with visual observations in seven additional counties (Big Horn, Custer, Dawson, Wibaux, Richland, Roosevelt and Yellowstone) at elevations up to 3800 feet (1158 meters); currently there are no reliable Montana records from the Missouri River or its tributaries. Snapping turtles have probably been introduced in several localities (there are unconfirmed reports from Gallatin, Ravalli, and Sanders counties); confirmed records from Flathead and Lake counties represent introductions.

Habitat

Habitat use by snapping turtles in Montana is probably similar to elsewhere in the range, but studies are lacking and there is little qualitative information available. They have been captured or observed in backwaters along major rivers, at smaller reservoirs, and in smaller streams and creeks with permanent flowing water and sandy or muddy bottoms (Reichel 1995, Hendricks and Reichel 1996, P. Hendricks personal observation). Nesting habitat and nest sites have not been described.

Elsewhere, snapping turtles occur in all types of shallow freshwater habitats, such as streams, rivers, reservoirs, and ponds, especially those with a soft mud bottom and abundant aquatic vegetation or submerged brush and logs (Hammerson 1999), and in brackish water in some areas. Although found most

often in shallower water, they have been reported on the bottom of lakes in water up to 10 meters deep. Temporary ponds may also be occupied. Hatchlings and juveniles tend to occupy shallower sites than mature individuals in the same water bodies. They are mostly bottom dwellers, where they spend much of their time. Although highly aquatic, they may make long movements overland if their pond or marsh dries (Baxter and Stone 1985, Ernest et al. 1994, Hammerson 1999). They hibernate singly or in groups in streams, lakes, ponds, or marshes; in bottom mud, in or under submerged logs or debris, under an overhanging bank, or in muskrat tunnels; often in shallow water; sometimes in anoxic sites (Brown and Brooks 1994). Sometimes they bask out of water, especially younger individuals and in the northern extremes of the global range.

Nests are built in soft sand, loam, vegetation debris, or even sawdust piles, most often in open areas and often a hundred meters or more from water (Congdon et al. 1987, Ernst et al. 1994, Hammerson 1999); they also nest in beaver and muskrat lodges.

Management

Montana populations of the snapping turtle are poorly understood, making management of them more difficult. It is likely that dams and large reservoirs on rivers (e.g. Fort Peck Dam and Reservoir) are detrimental to population continuity to some degree, (Maxell et al. 2003), although this species can travel overland and may be able to bypass some dams. Impacts of other habitat disturbances are not clear, but this species occupies man-made water bodies throughout its range that provide necessary resources and habitat characteristics. Construction of irrigation ditches and canals may have allowed this species to occupy man-made water bodies. Studies of nesting success, population structure, dispersal, and population size need to be conducted throughout the range of the snapping turtle in Montana.

Routine surveys for snapping turtles in appropriate habitats could be made a standard part of the field duties of agency fishery biologists. Records should be maintained of the incidental "take" by anglers, who should be encouraged to report any captured individuals; killed animals should be examined by agency fishery or wildlife biologists if possible so that data on sex, size, and food habits can be gathered and a base of information developed on the biology of this species in Montana. It is possible that even moderate harvest of adults by anglers in most localities will result in population declines, similar to Colorado (Hammerson 1999), because the life history of this species indicates recruitment of juveniles into breeding populations is low, and population densities in western states is probably low. Identified nesting sites should be monitored and protected from disturbance by humans.

Conservation Concerns

- Habitat loss
- Nest destruction and predation
- Human harvest of long-lived adults

Conservation Strategies

- Consider preparing management plan for Snapping Turtle or inclusion into other comprehensive taxonomic plan
- Meticulous tracking of observations
- Conservation of nest areas
- Surveys of suitable habitat that are designed to detect the species need to be carried out
- Consideration of restriction on harvests

Management Plan

None

Citations

Baxter, G. T. and M. D. Stone. 1985. Amphibians and reptiles of Wyoming. Second edition. Wyoming Game and Fish Department, Cheyenne.

Brown, G. P., and R. J. Brooks. 1994. Characteristics of and fidelity to hibernacula in a northern population of snapping turtles, *CHELYDRA SERPENTINA*. *Copeia* 1994:222-226.

Congdon, J. D., et al. 1987. Reproduction and nesting ecology of snapping turtles (*CHELYDRA SERPENTINA*) in southeastern Michigan. *Herpetologica* 43:39-54.

Ernst, C. H., J. E. Lovich, and R. W. Barbour. 1994. Turtles of the United States and Canada. Smithsonian Institution Press, Washington, D.C. 578 pp.

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DRAFT WORKING DOCUMENT DO NOT DUPLICATE

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6548

Spiny Softshell (*Apalone spinifera*)

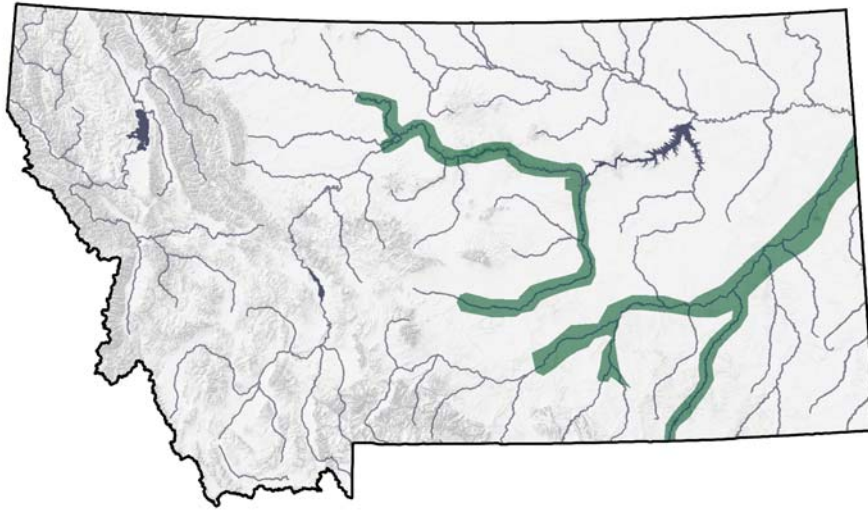


Figure 48. Distribution of the Spiny Softshell Turtle

Range

In Montana, native populations of the spiny softshell are present east of the Continental Divide in the Missouri River and Yellowstone River drainages, and some principle tributaries (Maxell et al. 2003). Large gaps remain in the species' range within Montana, especially in the Missouri River below the mouth of the Musselshell River. Spiny softshells in Montana are thought to be isolated from the remainder of the global population, and it appears the population in the Missouri River is isolated from the population in the Yellowstone River. Voucher specimens have been collected in five counties (Big Horn, Chouteau, Prairie, Rosebud, Wheatland), with visual observations in eight additional counties, at elevations up to 3600 feet (1097 meters); a questionable voucher record exists from Roosevelt County.

Habitat

Habitat use by spiny softshell in Montana is probably similar to elsewhere in the range, but studies are lacking and there is little qualitative information available. They occupy larger rivers and tributaries. Both sexes have been observed basking together on partially submerged logs in backwater sites of slow-moving water, and on sandy or muddy riverbanks (P. Hendricks personal observation).

Generally, the spiny softshell is primarily a riverine species, occupying large rivers and river impoundments, but also occurs in lakes, ponds along rivers, pools along intermittent streams, bayous, irrigation canals, and oxbows. It usually is found in areas with open sandy or mud banks, a soft bottom, and submerged brush and other debris. Spiny softshells bask on shores or on partially

submerged logs. They burrow into the bottoms of permanent water bodies, either shallow or relatively deep (0.5 to 7.0 meters), where they spend winter. Eggs are laid in nests dug in open areas in sand, gravel, or soft soil near water (Baxter and Stone 1985, Ernst et al. 1994, Hammerson 1999, Stebbins 2003).

Management

Montana populations of the spiny softshell are poorly understood, making management of them more difficult. It is apparent that the construction of dams and large reservoirs on rivers (e.g. Fort Peck Dam and Reservoir) is detrimental to population continuity, effectively creating smaller isolated populations. Impacts of other habitat disturbances are not clear. Studies of nesting success, population structure, dispersal, and population size need to be conducted throughout the range of both Montana sub-populations (Missouri River and Yellowstone River). Routine surveys for softshells in appropriate habitats could be made a standard part of the field duties of agency fishery biologists. Records should be maintained of the incidental "take" by anglers, who should be encouraged to report any captured spiny softshell; killed animals should be examined by agency fishery or wildlife biologists if possible so that data on sex, size, and food habits can be gathered and a base of information on the biology of this species developed. Nesting sites need to be identified and protected from disturbance by human activities.

Conservation Concerns

- Barriers that hamper movement of Spiny Softshell
- Habitat loss
- Nest disturbance
- Incidental take from anglers

Conservation Strategies

- Consider preparing management plan for Spiny Softshell or inclusion into other comprehensive taxonomic plan
- Conservation of major rivers in Montana
- Protect nest site from human disturbance
- Record keeping of observations

Management Plan

None

Citations

Baxter, G. T. and M. D. Stone. 1985. Amphibians and reptiles of Wyoming. Second edition. Wyoming Game and Fish Department, Cheyenne.

6626

6627 Ernst, C. H., J. E. Lovich, and R. W. Barbour. 1994. Turtles of the United States
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Western Hognose Snake (*Heterodon nasicus*)

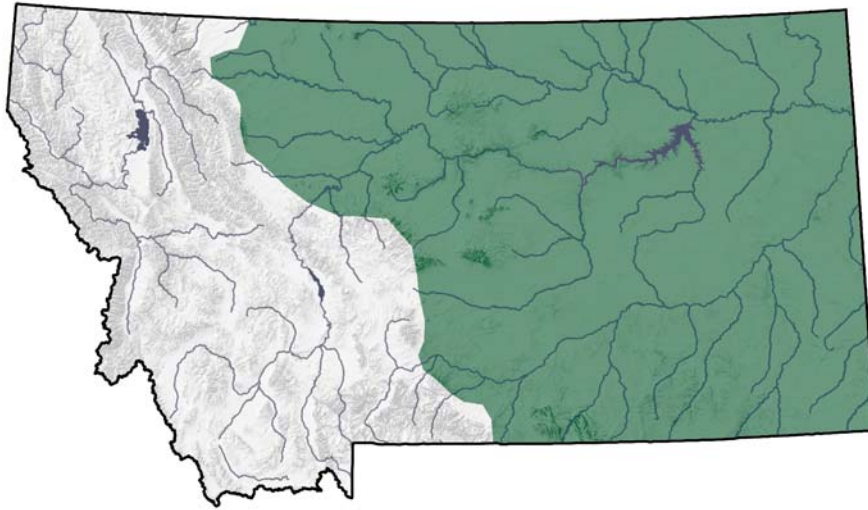


Figure 49. Distribution of the Western Hognose Snake

Range

In Montana, the western hognose snake is found east of the Continental Divide throughout the prairies, although significant gaps in the known distribution remain in the central region between the "island" mountain ranges, and there are few reports statewide in the last ten years (Maxell et al. 2003). Voucher specimens exist for 17 eastern counties, and there are observation records from seven additional counties, at elevations up to 4060 feet (1237 meters).

Habitat

Little specific information for the state is available. They have been reported in areas of sagebrush-grassland habitat (Dood 1980) and near pine savannah in grassland underlain by sandy soil (Reichel 1995, Hendricks 1999). Distribution of soil and vegetation and proximity to water could be limiting factors for distribution.

In other locations, their apparent preference for arid areas, farmlands, and floodplains, particularly those with gravelly or sandy soil, has been noted. They occupy burrows or dig into soil, and can be found under rocks or debris, during periods of inactivity (Baxter and Stone 1985, Hammerson 1999, Stebbins 2003).

Management

Apparently the western hognose snake was relatively abundant in Montana during the late 19th Century. In 1876 it was the third most common reptile (after the western rattlesnake and short-horned lizard) along the Missouri River

between Fort Benton and the mouth of the Judith River (Cope 1879). This is no longer the case (Maxell et al. 2003); the few recent records suggest that the species is uncommon throughout Montana, although its status is largely unknown. The apparent decline in abundance of hognose snakes may be related to extensive habitat loss associated with conversion of prairie to agricultural landscapes. As in other regions, an unknown percentage of local populations experience road mortality, as many specimen and observation records are of road-killed individuals. Draining of prairie wetlands may have negative impacts on their preferred prey (toads and frogs particularly, and perhaps turtle eggs).

Management of hognose snakes in Montana is hampered by a lack of basic information on abundance, food habits, and habitat associations. Currently, protecting grassland habitat and, where possible, preventing the destruction of rattlesnake dens where they might overwinter are the recommended conservation measures.

Conservation Concerns

- Distribution, status and habitat uses are poorly understood
- Some evidence for declines potentially associated with habitat loss
- Pet trade industry
- Specialist diet (amphibians)
- Declines in prey (amphibians)

Conservation Strategies

- Develop a comprehensive taxonomic management plan (e.g. for reptiles) that includes the Western Hognose Snake that addresses the above listed concerns
- Record all observations of this species to continue establishing its range in Montana
- Increase education and information on reptile biology and awareness of the importance of den and nest sites
- Targeted surveys (specific to hognose snakes) in suitable habitat to continue determining their range in Montana

Management Plan

None

Citations

Baxter, G. T. and M. D. Stone. 1985. Amphibians and reptiles of Wyoming. Second edition. Wyoming Game and Fish Department, Cheyenne.

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6746

Milk Snake (*Lampropeltis triangulum*)

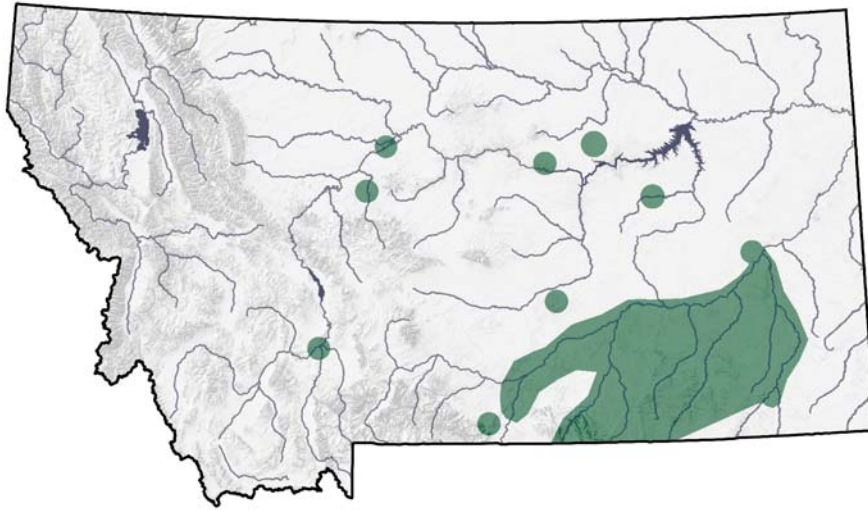


Figure 50. Distribution of the Milk Snake

Range

In Montana, the milk snake is found east of the Continental Divide throughout much of the prairie regions, although mostly south of the Missouri River (Maxell et al. 2003); significant gaps are present in the known distribution, probably due in part to a combination of restricted habitat preferences, extensive use of cover (i.e. rocks), and nocturnal habits. Voucher specimens exist for seven counties (Carbon, Chouteau, Custer, Garfield, Phillips, Powder River, Yellowstone), and there are observation records for four additional counties (Big Horn, Musselshell, Prairie, Rosebud), at elevations up to 3960 feet (1207 meters). Questionable records exist for Cascade County near Belt, and the boundary of Broadwater, Gallatin, and Jefferson counties near Three Forks.

Habitat

Little specific information is available. Milk snakes have been reported in areas of open sagebrush-grassland habitat (Dood 1980) and ponderosa pine savannah with sandy soils (Hendricks 1999, B. Maxell personal communication, L. Vitt personal communication), most often in or near areas of rocky outcrops and hillsides or badland scarps, sometimes within city limits.

Management

So few recent milk snake records exist for Montana (Maxell et al. 2003) that it is difficult to determine if management activity is needed. Nevertheless, the widely scattered recent records indicate that milk snakes continue to occupy a large part of the known range in the state, and some sites near a large urban center have

remained occupied for the last 40 to 45 years (L. Vitt personal communication). Management for this species is hampered by a lack of basic information on abundance, food habits, and habitat associations. No specific management activities are suggested at this time, other than to protect known occupied habitat and monitoring their use in the pet trade.

Conservation Concerns

- Distribution, status, and biology are poorly understood
- Pet trade industry

Conservation Strategies

- Develop a comprehensive taxonomic management plan (e.g. for reptiles) that includes the milk snake and that addresses the above conservation concerns
- Record all observations of this species to continue establishing its range in Montana
- Increase education and information on reptile biology and awareness of the importance of den and nest sites
- Targeted surveys (specific to the Milk Snake) in suitable habitat to continue determining its range in Montana

Management Plan

None

Citations

Dood, A. R. 1980. Terry Badlands nongame survey and inventory: final report. [BLM Contract #YA-512-CT8-217]. Montana Dept. of Fish, Wildlife, and Parks. 70 pp.

Hendricks, P. 1999. Amphibian and reptile survey of the Bureau of Land Management Miles City District, Montana. Montana Natural Heritage Program, Helena, Montana. 80 pp.

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Werner et al. 2004. Amphibians and Reptiles of Montana.

Smooth Green Snake (*Liochlorophis vernalis*)

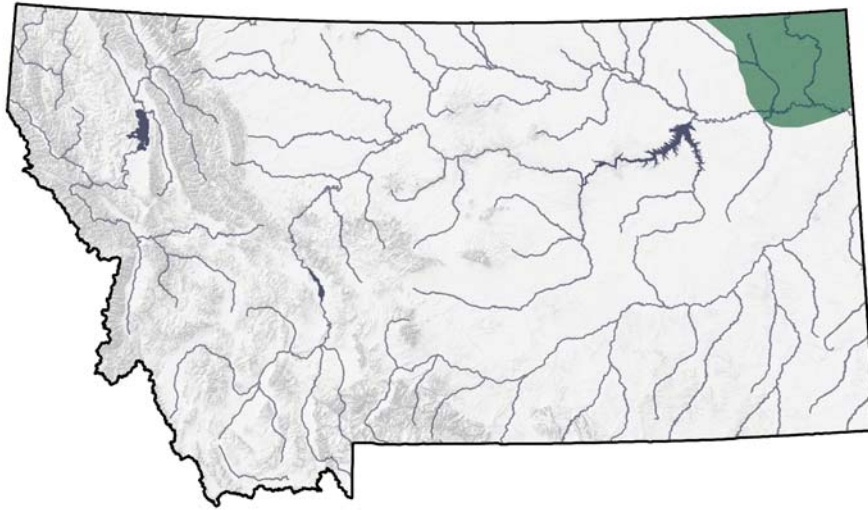


Figure 51. Distribution of the Smooth Green Snake

Range

Montana is at the edge of the global range. The smooth green snake is restricted to extreme northeastern Montana north of the Missouri River, at elevations below 2150 feet (655 meters). There are reliable records from Sheridan County (Maxell et al. 2003) and recently found in Valley County, as well as undoubtedly occurs in Roosevelt County. This snake may eventually be documented south of the Missouri River near the boundry with North Dakota.

Habitat

Little information is available for the species in Montana, though it has been reported from residential lawns, city parks, along ditches in the Prairie Pothole Region, and around wetland complexes. Based upon observations outside Montana, the smooth green snake is known to occupy meadows, grassy marshes, moist grassy fields at forest edge, mountain shrublands, stream borders, bogs, open moist woodland, abandoned farmland, and vacant lots. Periods of inactivity are spent underground, beneath woody debris and rocks, or in rotting wood. They have been found hibernating in abandoned ant mounds. Most activity is restricted to the ground, but they may climb into low vegetation, and sometimes enter water (Hammerson 1999).

Management

No special management activity is defined at this time. Habitat within areas that are known to be occupied by smooth green snakes should be protected.

Conservation Concerns

- Distribution, status, and biology in Montana are poorly understood

Conservation Strategies

- Develop a comprehensive taxonomic management plan (e.g. for reptiles) that includes the Smooth Green Snake and that addresses the above conservation concerns
- Record all observations of this species to continue establishing its range in Montana
- Increase education and information on reptile biology
- Targeted surveys (specific to the Smooth Green Snake) in suitable habitat to continue determining its range in Montana

Management Plan

None

Citations

Hammerson, G. A. 1999. Amphibians and reptiles in Colorado. Second edition. University Press of Colorado, Boulder, Colorado. xxvi + 484 pp.

Maxell, B. A., J. K. Werner, P. Hendricks, and D. L. Flath. 2003. Herpetology in Montana: a history, status summary, checklists, dichotomous keys, accounts for native, potentially native, and exotic species, and indexed bibliography. Northwest Fauna.

Werner et al. 2004. Amphibians and Reptiles of Montana.

Birds

Common Loon (*Gavia immer*)

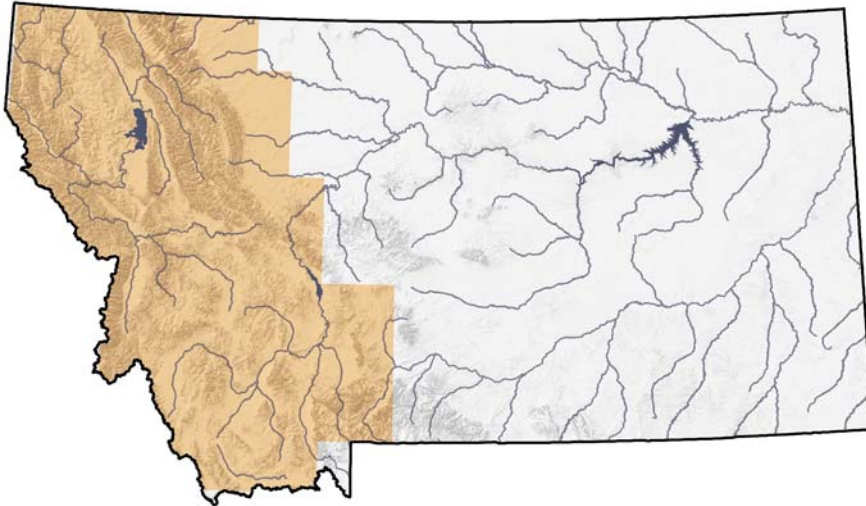


Figure 52. Distribution of the Common Loon

Range

The global population of Common Loons is considered “secure” (IUCN G5 Ranking); however, many local populations are small, isolated and are vulnerable to extinction primarily due to habitat loss and human encroachment into key habitat (Kelly 1992, Evers 2004). Loons are considered imperiled (MT ranking S2) by the Montana Natural Heritage Program and are already listed as a “sensitive species” by the U. S. Forest Service (R-1) and a Species of Management Concern by the USFWS Region 6 (U.S. Fish and Wildlife Service 1995).

In Montana, the current breeding range for Common Loons is primarily restricted to lower elevation forested glacial lakes in the northwest corner of the state. Historically, Common Loons were believed to have nested throughout the western half of the state where suitable habitat was found. The primary nesting habitat currently used is restricted to lakes in the Blackfoot, Flathead, and Kootenai River drainages with some breeding occurring on the east side of Glacier National Park and on the Blackfeet Indian Reservation, loons also currently nest in Yellowstone National Park; historic records include lakes in southwest Montana. Common Loons breeding in Canada migrate through the entire state during spring and fall. Rafts of over 60 birds have been frequently observed on major lakes and reservoirs throughout the state. Nonbreeding common loons are occasionally observed during the summer in Montana also on larger lakes or reservoirs. A pair of Common Loons once nested in central Montana, at Nelson Reservoir near Malta (F. Prellwitz, pers. com. in Dolan 1994). Common Loons have been recorded as breeding in 11 Montana counties:

Lincoln, Flathead, Glacier, Sanders, Lake, Missoula, Powell, Lewis and Clark, Teton, Beaverhead, and Madison counties (Montana Bird Distribution 2003, MTNHP 2002) (Montana Animal Field Guide 2004). The northwestern portion of Montana supports the highest density of nesting Common Loons in the lower 48 states west of the Mississippi River. Based on coordinated total counts of common loons in mid-July over the last six years, Montana supports an average of 62 (+/- 5) breeding pairs who successfully raise an average of 43 (+/- 8) chicks each year. In addition, surveyors count an average of 48 single or nonbreeding adult loons. Total mid-summer loon counts since 1999 range have averaged 217 (range 201-230). Based on these data, the population appears to be stable (Bissell 2005).

Based on recoveries or reobservations of adult and juvenile banded Common Loons first captured on nesting lakes in northwest Montana, our loons appear to winter along the west coast from Washington to the mid-California coast (Bissell 2005). Occasional over wintering also occurs in Montana. Common Loons have been observed over wintering (December 15 – February 15) in Lincoln, Flathead and Lake counties (Montana Bird Distribution 2003).

Habitat

In Montana, Common Loons will generally not nest on lakes less than about 13 acres in size or over 5000 feet in elevation (Skaar 1990). If nesting on a small lake, they may use an adjacent lake for supplementary foraging (Montana Animal Field Guide 2004). Successful nesting requires both nesting sites and nursery areas sheltered from winds and disturbances. Small islands, coves, and bays are preferred general areas for nesting. Loons must nest adjacent to water and they frequently nest on herbaceous shoreline areas but also logs, stumps, muskrat houses, floating vegetative mats, and gravel shorelines if that is all that is available. Nests usually consist of aquatic vegetation shaped into a shallow bowl located within a few inches of the water's edge. Nursery areas are very often sheltered, shallow coves with abundant small fish and insects (Skaar 1990). Most Montana lakes inhabited by Common Loons are relatively oligotrophic and have not experienced significant siltation or other hydrological changes.

Nesting loons are very sensitive to disturbances from humans. Based on studies by Don Skarr and Lynn Kelly in the 1980s and 1990s, human disturbances from boaters and anglers were causing a significant number of nest failures. During the 1980's, campgrounds and cabin development occurred on many loon nesting lakes. In some areas such as on Seeley Lake and along the Thompson Chain of Lakes where recreation was increasing, loons spent significantly more time away from their nests compared to nesting loons on lakes with little human use boats. Over time, several pairs of loons on the busier lakes were unsuccessful and have since abandoned their territories on Seeley, Salmon, and two lakes in the Thompson Chain of Lakes (Kelly 1992).

The quantity and quality of nesting habitat may limit the loon population of northwest Montana. Skaar (1990) estimated the state's "carrying capacity" at 185 potential nesting territories, based on the size and number of lakes within the species' breeding distribution. He assumed 100 ha of surface area per pair. Kelly (1992) documented a density of 72.2 surface ha of water per adult loon for the Tobacco, Stillwater, Clearwater, and Swan River drainages.

Loons are a long-lived slowly reproducing species that raise a maximum of only 1-2 young per year. It takes 3 years for loons to acquire adult plumage and an average of 7 years before adults successfully occupy a territory and raise young (Evers 2004). Adults may live to 20 years or more. Juvenile birds spend 3 winters in coastal waters before returning inland in adult plumage. Scientists studying common loons in other parts of their range estimate juvenile recruitment rates to the adult state (3 years) to be about 40% (Evers 2004). Loons are also poor colonizers with the young returning to within 5-20 km of their natal area. This slow reproductive rate combined with limited dispersal distance and extreme territoriality presents some unique challenges to wildlife managers. Common Loon habitat is relatively restricted in nature. Given their fierce territorial behavior to maintain successful occupation of a lake or portion of a lake, the occupation of all available habitats will inevitably lead to greater territorial conflicts. In recent years, Montana loon observers have picked up at least 2 dead loons thought to have died from chest impact wounds from defending adults. Observers have also reported chicks snatched by bald eagles or floating away during territorial squabbles (Bissell, pers. comm. 2005). Repeated nest failures at Upper Thompson Lake in both 2004 and 2005 appear to be related to fighting, territorial switching, and general competition between 2 adjoining nesting pairs of loons and other territorial pairs in the drainage.

In Common Loon populations of the northeast U.S. and Canada, the accumulation of methyl mercury is a threat to Common Loon survival (Evers 2004). In addition, ingestion of lead sinkers has been a source of mortality (Evers 2004). In Montana, methyl mercury levels in most Common Loon blood or egg samples are low to moderate indicating that current levels of mercury contamination are not a threat to population health.

Management

Since 1999, management of Common Loons and their habitat in Montana is coordinated through the Common Loon Working Group (CLWG), an ad hoc advisory group consisting of representatives from state and federal agencies, tribes, non-profit organizations such as the Montana Loon Society, and industry. This group coordinates surveys, research, and management programs and meets at least twice a year. The CLWG has helped solicit and fund the Loon Ranger Program as well as the recently started Loon Ecology Project using a State Wildlife Grant.

The current management program entails many activities focused on loon conservation including two coordinated annual population surveys: one in mid-May on accessible breeding lakes to determine territorial pair presence and possibly nesting; and a second survey in mid-July to count both adults and chicks of the year. The data are collected by the CLWG and housed in a centralized database maintained by the Montana Natural Heritage Program

The management program also consists of implementing an annual outreach and education program using “Loon Rangers” at most breeding lakes that have high levels of recreation use. Through FWP’s summer internship program, 3-4 college students are hired each year to help with educational signs, floating buoys, surveys, and education programs at the busiest nesting lakes. The Loon Ranger program was initiated in 2000. Funding is provided by both agencies and private donations. For many lakes, management includes the setting out of floating buoys around nest sites where conflicts with boaters has occurred; the use of artificial loon platforms or nesting islands on lakes where nesting habitat has been reduced or lakes levels affected. Until recently, Glacier National Park participated only in annual surveys. This year, Glacier is initiating a citizen science program to more closely monitor nesting loons within the Park. FWP has summarized the various CLWG activities over the last 5 years through periodic annual reports available through the Wildlife Division or Region One headquarters. Preliminary evaluation of the education program indicates nesting success has been maintained or increased in the areas served by the program.

Other management options that have been occasionally implemented by lakeshore landowners such as FWP, DNRC, and the Forest Service include managing access to lakes through seasonal closures of trails or campsites, rerouting of roads or trails, strategic placement of educational signs, changing the design or upgrades of boat ramps, implementing no-wake rules, and providing input on proposed development projects. The members of the CLWG also work with homeowner associations to identify areas in need of conservation.

The new research efforts are focused on determining habitat factors associated with nesting success at various habitat scales; monitoring levels of methyl mercury and other contaminants in loon eggs and blood; estimating Montana’s potential habitat capacity and the relationship between Montana’s breeding population and adjoining populations to the west (Washington), north (Canada) or south (Wyoming); determining adult and juvenile survival and recruitment rates, and estimating overall population trend. The results will be used to update Montana’s Common Loon Conservation Plan in 2008.

Conservation Concerns

- Disturbances to loon nesting and foraging lakes and shorelines caused by human activities such as boating, angling, camping, or other activities during the nesting season
- Loss of nesting habitat including alternative nesting areas and nursery areas due to development, water level alterations, and recreation
- Loss of connectivity within Montana's populations as well as between Montana's population and other western populations
- Accumulation of contaminants over life of individual birds, including lead poisoning

Conservation Strategies

- Need for population demographic and trend information for Montana as well as increased knowledge of migratory routes and other factors affecting over winter survival
- Need to estimate total amount of available habitat and percent occupancy of that habitat based on historic and current habitat conditions
- Need to implement a territorial ranking system to help identify priority nesting lakes or areas
- Need to identify areas of population sinks and sources
- Need to continue to investigate known causes of mortality including the effect of human sources including methyl mercury and lead on breeding loons
- Need to maintain the suitability of currently used nesting territories and create site-specific management plans that use a variety of tools to maintain loon nesting sites and nursery areas
- Need to identify risks and potential threats outside Montana to Montana's breeding population and the consequences of those risks
- Need to keep current data base up to date and available for interagency use
- Complete ongoing research efforts to revise loon conservation plan
- Provide for continued cooperative funding for education and other aspects of ongoing loon management plan

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Trumpeter Swan (*Cygnus buccinator*)

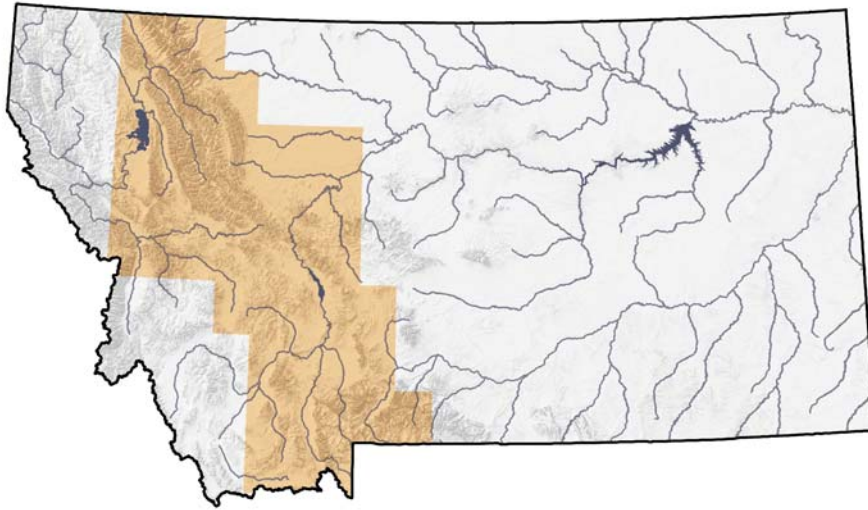


Figure 53. Distribution of the Trumpeter Swan

Range

Trumpeter Swans breeding in Montana are all part of the Rocky Mountain Population, which occurs all along the Rocky Mountain Range. The breeding range of these Trumpeter Swans in Montana is restricted to the extreme southwest corner of the state (Beaverhead County) and along the Rocky Mountain Front (Lewis and Clark County) (Montana Natural Heritage Program 2003). In Beaverhead County, Trumpeter Swans breed in Red Rock Lakes National Wildlife Refuge in the Centennial Valley, specifically the Lima Reservoir and the Upper and Lower Red Rock Lakes. In Lewis and Clark County they inhabit several small pothole lakes along the Front Range of the Rocky Mountains, most of which are west and southwest of Augusta. This is a very small subpopulation of the larger population breeding in the Centennial Valley (MTNHP 2003). Reintroductions are currently ongoing on the Flathead Indian Reservation in northwestern Montana as well.

The non-breeding range of Trumpeter Swans is also limited to several areas in the southwestern part of the state (Beaverhead, Gallatin, and Madison counties). Virtually all of the birds breeding in southwestern Montana also winter there. Birds summering in Canada that migrate to the area to winter join them. In Beaverhead County, the Red Rock Lakes area in the Centennial Valley is a major wintering ground for the species. In Madison County, they winter at Ennis Lake and the Madison River up to approximately 15 miles upstream. In Gallatin County, Trumpeter Swans winter on the south fork arms of Hebgen Reservoir, as well as the river below Hebgen Dam and several other smaller lakes in the area (MTNHP 2003).

Trumpeter Swans breeding in Montana are non-migrants. They spend both the breeding season and the winter in southern Montana's lakes, ponds, and streams of the Red Rock Lakes National Wildlife Refuge. The Canadian subpopulation breeding in parts of British Columbia, Alberta, the Yukon, and the Northwest Territories will move south in late October to early November (Mitchell 1994).

Fall migration dates for the Bozeman area are November 15 to December 15 (Skaar 1969). They usually follow the Rocky Mountain Front moving further south as water freezes or food diminishes. They eventually arrive in southern Montana and winter along with the resident population. Canadian swans leave their wintering grounds in early March to early April, moving up the Rocky Mountain Front toward their breeding habitat further north (Mitchell 1994). Migration dates for Bozeman are February 25 to April 15 (Skaar 1969).

Habitat

The breeding habitat for Trumpeter Swans in the Red Rock Lakes/ Centennial Valley of Montana includes lakes and ponds and adjacent marshes containing sufficient vegetation and nesting locations. Along the Rocky Mountain Front the breeding habitat is small pothole lakes, generally with sufficient water to maintain emergent vegetation through the breeding season (MTNHP 2003). However, due to recent drought conditions, this small breeding population has been severely impacted. In 2003, there was an attempt by swans to nest in the Upper Blackfoot drainage, and this area is targeted for future population augmentation or reintroduction for trumpeter swans. Habitat requirements for breeding include room to take off (~100 m), shallow, unpolluted water with sufficient emergent vegetation and invertebrates, appropriate nest sites (i.e. muskrat lodges), and areas with little human disturbance (Mitchell 1994).

Their nonbreeding habitat in Montana is the many large and small lakes and ponds in extreme southern Montana, including the breeding area of the Red Rock Lakes/Centennial Valley. Swans also winter in the Ennis Lake and Madison River complex, as well as Hebgen Lake and the surrounding area. During winter appropriate habitat is areas where water does not freeze and food is plentiful and accessible. Swans will move out of one lake or pond to another if conditions become too severe.

Management

Management for Trumpeter Swans began in Montana in the early 1930s with the designation of Red Rock Lakes National Wildlife Refuge (RRLNWR). This refuge was specifically created for continued Trumpeter Swan presence and for active management practices. These early management practices consisted of protection from shooting, winter-feeding stations, and relocation to other breeding locations (Mitchell 1994). Some of these management activities are still in practice today, along with others including habitat restoration, human recreation

management, breeding, wintering habitat management, and winter translocation work (Mitchell 1994). Since 1988, Trumpeter Swans have been relocated from Red Rock Lakes NWR in southern Montana to locations in Idaho, Oregon, Wyoming and Utah to promote exploration of new wintering and habitats and to remedy the increasing problem of overpopulation in the refuge during winter. The goal is to have less than 10% winter at any one site and no swans wintering at Red Rock Lakes NWR (Baskin 1993). In 1993, winter feeding stations were terminated in the Red Rock Lakes NWR. It was believed these stations were reducing the winter range expansion work, as birds would not actively explore new wintering locations if food were made readily available in the refuge. Since then, Trumpeter Swans have indeed dispersed to new areas in the west and the remaining population in RRLNWR has stabilized. Other management techniques include the biannual Trumpeter Swan surveys conducted in the state, the management of Mute Swan populations, and the implementation of land-use guidelines on state, federal and provincial lands. All these practices are described and supported by The North American Management Plan for Trumpeter Swans (1984). As noted in the distribution comments, the Confederated Salish and Kootenai Tribes in northwestern Montana are also reintroducing Trumpeter Swans on the Flathead Indian Reservation. Trumpeter Swans are a Species of Management Concern in Region 6 (U.S. Fish and Wildlife Service 1995).

Conservation Concerns

- Isolation of breeding populations
- Wetland degradation and destruction
- Lack of information of breeding success
- Vulnerable to power line collisions

Conservation Strategies

- Relocate power lines underground in areas adjacent to nesting and brood rearing locations
- Wetland restoration programs
- Continue survey and monitoring of populations
- Protect known nesting habitat and manage nesting habitat in a manner compatible with increasing swan production

Management Plans

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Harlequin Duck (*Histrionicus histrionicus*)

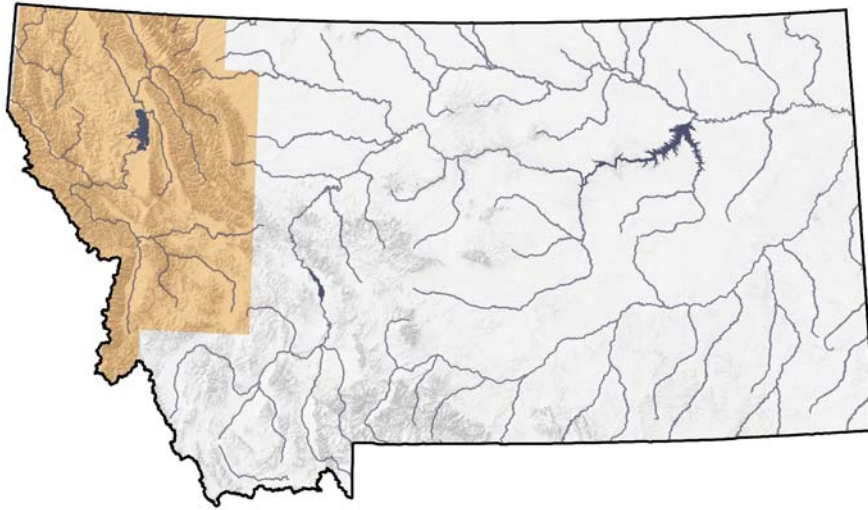


Figure 54. Distribution of the Harlequin Duck

Range

The Harlequin Duck range is small and fragmented. Found primarily in Northwestern Montana and parts of Greater Yellowstone Ecoregion.

Harlequin ducks breed from Alaska and western Canada, south to eastern Oregon, east-central California, Idaho and Wyoming; also breeds in eastern Canada. Winters from Aleutian and Pribilof Islands, south to central California; also winters from Maritime Provinces south to Maryland (Karl 2000). In North America harlequin ducks winter along the North Pacific coast, then migrate inland to nest along swiftly flowing mountain streams (Bellrose 1980). Although still globally widespread, the Atlantic population may be reaching critically low levels and the Pacific population has experienced substantial declines (NatureServe 2004).

Habitat

In Montana, most Harlequin Ducks inhabit fast moving, low gradient, clear mountain streams. Overstory in Montana does not appear to affect habitat use: 1) in Glacier National Park, birds used primarily old-growth or mature forest (90%); and 2) most birds in streams on the Rocky Mountain Front were seen in pole-sized timber (Diamond and Finnegan 1993). Banks are most often covered with a mosaic of trees and shrubs, but the only significant positive correlation is with overhanging vegetation (Diamond and Finnegan 1993, Ashley 1994).

The strongest stream section factor in Montana appears to be for stream reaches with 2+ loafing sites per 10 m (Kuchel 1977, Diamond and Finnegan 1993,

Ashley 1994). Broods may preferentially use backwater areas, especially shortly after hatching (Kuchel 1977), though this is not apparent in data from other studies (Ashley 1994). Stream width ranges from 3 m to 35 m in Montana. On stream gradients of 7%, occupied stream reaches ranged from 1.8% to 2.8% (Fairman and Miller 1990), while velocity at 42 Harlequin observation points ranged from 0.8-4.1 m per second (Diamond and Finnegan 1993). Harlequins in Glacier National Park used straight, curved, meandering, and braided stream reaches in proportion to their availability, as was the case for bottom types (Ashley 1994).

No nest sites have been reported from Montana; in the Pacific northwest, nests have been reported on rocks (3); on the ground (2); in a cliff face (1); (Bent 1925, Campbell et al. 1990); in piles of woody debris (2) (Jewett 1931, Thompson 1985); in tree cavities (2); and in a cavity on a cliff (1) (Cassirer et al. 1993).

Four habitat characteristics were noted at more than 50% of harlequin duck observations in the Tetons (Wallen 1987): 1) streamside perennial shrub vegetation; 2) meandering (braided) channel types; 3) more than 3 loafing sites/10 m; and 4) areas unused by humans. Wallen (1987) postulated that human activities might have a greater influence on breeding success than available habitat. Feeds primarily on crustaceans, mollusks, insects, and a few small fishes (Karl 2000). The Harlequin Duck Working Group (1993) has identified inventory needs for both the Atlantic and Pacific populations for wintering and breeding habitats.

In 1990 the harlequin duck was identified as potentially imperiled in western Montana. By 1991, it was considered as a candidate for listing on the Federal threatened or endangered species list. Considered a sensitive or indicator species, it is among the first species to reflect damage to the type of pristine environments where they remain (Street 1999).

Harlequin ducks breed locally on mountain streams in the western part of the state (Reichel and Genter 1995), including the Kootenai, Flathead, Clark Fork, and Blackfoot River drainages. Scattered breeding also occurs along the Rocky Mountain Front and the north edge of Yellowstone National Park (Montana Partners in Flight 2004). Harlequin ducks are known to occur in Bonner, Boundary, Clearwater, and Shoshone counties in Idaho. Harlequin ducks in Glacier National Park confine almost all activities to swiftly running waters (90% of area used), but also used cut-off side channels and other backwaters during periods of high water and as brood rearing habitat (Kuckel 1977). Females with broods avoided all areas frequented by humans. Occupied streams in north Idaho were usually in mature/old growth western red cedar/western hemlock or Engelmann spruce/subalpine fir stands. Cassirer and Groves (1991) suggested that the presence of mature/old growth forest in north Idaho might indicate streams with high quality, low sediment loads, intact riparian areas, and relative inaccessibility to humans. Stream sections most suitable for harlequin breeding

had gradients less than 10 degree and banks lined with dense perennial shrubs; breeding and brood rearing occurred on streams with a mean gradient less than 30 degrees. In Idaho hens nest in cliff cavities, tree cavities, and on the ground.

Management

No specific management for harlequins in Montana however continued survey and monitoring efforts by MTNHP have identified migration areas used by harlequin ducks.

Conservation Concerns

- Loss and/or degradation of habitat from mining, logging, unsustainable grazing
- Human disturbance by paddlers (especially in breeding season)
- Water pollution on headwater streams utilized for nesting, brood-rearing and prey base
- Hunting on wintering grounds
- Destruction of watershed stability and stream flow regimes. High water during nesting and brood rearing can reduce or eliminate productivity. Low water will render feeding and brood rearing habitats unavailable
- Impoundments and diversions on breeding streams

Conservation Strategies

- Continue survey efforts to find occupied streams throughout its range in the state, to develop and track a statewide population estimate
- Reduce streambank or channel alteration along breeding habitat
- Decrease human disturbance such as boating, hiking and camping during breeding season
- Avoid increasing peak flows during nesting season
- Avoid increasing sedimentation
- Manage grazing to maintain riparian vegetation and streambank stability in excellent condition

Management Plans

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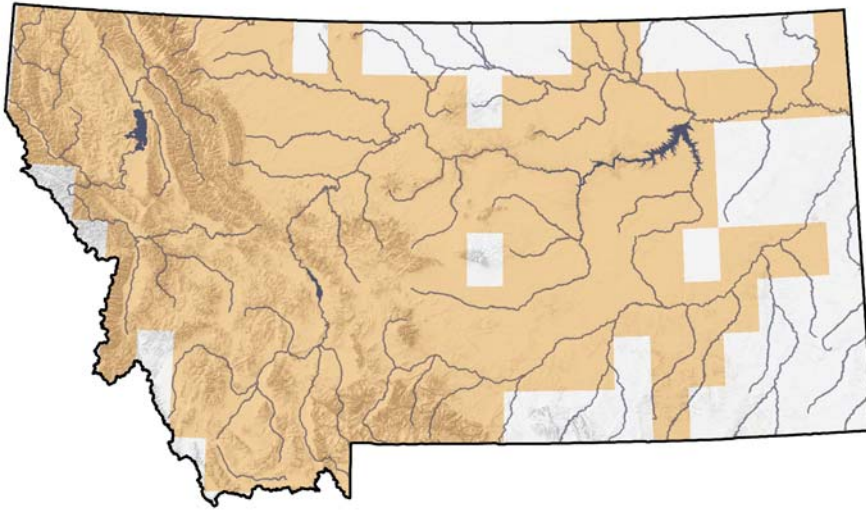
Bald Eagle (*Haliaeetus leucocephalus*)

Figure 55. Distribution of the Bald Eagle

Range

The majority of birds nesting in Montana are found in the western third of the state; although breeding pairs may be found along many of the major rivers and lakes in the central portion of the state and along the Yellowstone and Missouri Rivers to the eastern prairie lands (Montana Bald Eagle Working Group 1994, MBD 2003). East of the Continental Divide, the presence of Bald Eagles may be somewhat more seasonally dependent than in the western part of the state, for migrants from more northerly climes travel through Montana to reach their wintering grounds further south.

In recent years, one of the largest fall (mid-October to mid-December) migration concentrations (200 to 300 birds at any one time, close to a thousand individuals throughout the season), to take advantage of spawning salmon, occurred at Canyon Ferry Reservoir on the Missouri River, near Helena. Formerly, migrating Bald Eagles were known to gather in large numbers in Glacier National Park where spawning Kokanee salmon were abundant. No evidence exists, however, that the eagles on the Missouri River were those that formerly congregated in Glacier National Park (Montana Bald Eagle Working Group 1994). Subsequent shifting of fall congregations is expected as salmon populations peak and wane throughout the eagle's migration corridor. See the Montana Bald Eagle Management Plan for further details and descriptions of recovery zones (Montana Bald Eagle Working Group 1994).

Habitat

In Montana, as elsewhere, the Bald Eagle is primarily a species of riparian and lacustrine habitats (forested areas along rivers and lakes), especially during the breeding season. Important year-round habitat includes wetlands, major water bodies, spring spawning streams, ungulate winter ranges and open water areas (Bureau of Land Management 1986). Wintering habitat may include upland sites. Nesting sites are generally located within larger forested areas near large lakes and rivers where nests are usually built in the tallest, oldest, large diameter trees. Nesting site selection is dependent upon maximum local food availability and minimum disturbance from human activity (Montana Bald Eagle Working Group 1994). See the Montana Bald Eagle Management Plan (1994) for further details including home range sizes and habitat requirements of fledgling birds.

Management

General objectives of habitat management for Bald Eagles in Montana include: maintaining prey bases; maintaining forest stands currently used or suitable for nesting, roosting, and foraging; planning for future potential nesting, roosting, and foraging habitat; and minimizing disturbances from human activities in nest territories, at communal roosts, and at important feeding sites, including water (MBEWG 1991). The Montana Bald Eagle Management Plan (MBEWG 1994) directs management of this species in the state. Specific objectives identified in the plan include: a minimum of 800 nesting pairs in the 7-state Recovery Area, 99 of these in Montana; nesting success rate of 65% in occupied sites over a 5-year period with annual average production of 1.0 fledged young per pair; population goals were realized in at least 80% of management zones with nesting potential; and continued population increases for 5 consecutive years. See the Habitat Management Guide for Bald Eagles in Northwestern Montana (MBEWG 1991) and the Montana Bald Eagle Management Plan (MBEWG 1994) for further details on management guidelines and recovery objectives.

Conservation Concerns

- Maintaining forest stands currently used or suitable for nesting, roosting and foraging
- Sensitive to human disturbance particularly if activity occurs after nest initiation and prior to fledging
- Water turbidity caused by human activity, rendering water unsuitable for foraging
- Contaminants (lead, residual pesticides)

Conservation Strategies

- Continue periodic monitoring and surveying for breeding pairs and locations of nests
- Minimize disturbance within and near nesting territories during the nesting season

- Follow MBEWG guidelines of no more than 10% of shoreline be developed on lakes within occupied nesting territories
- Development of and updated living with Bald Eagles brochure

Management Plans

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Greater Sage-grouse (*Centrocercus urophasianus*)

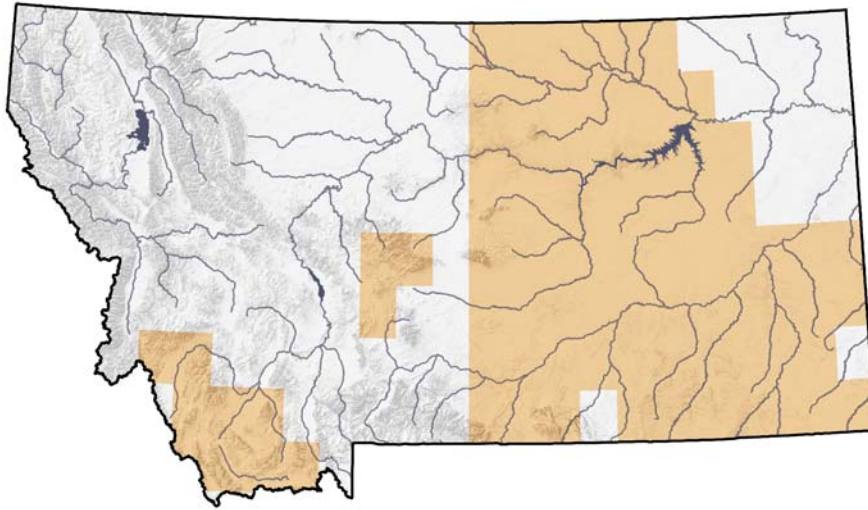


Figure 56. Distribution of the Sage-grouse

Range

Sage-grouse are native to the sagebrush steppe of western North America, and their distribution closely follows that of sagebrush, primarily big sagebrush (*A. tridentata*). Distribution of sage-grouse in Montana includes the eastern one-half and southwest corner of the state—roughly 27 million acres (11 million ha) of sagebrush-grassland in 39 counties. In eastern Montana, where close interspersions of wintering, nesting, and brood-rearing habitat rarely require large seasonal movements, sage-grouse are essentially nonmigratory. Some sage-grouse in southwestern Montana are migratory, moving between separate summer and winter areas.

Historically, sage-grouse occupied the Bitterroot Valley in western Montana, southwestern Montana, most of eastern Montana, and far western North Dakota and South Dakota (Schroeder et al. 2004). One specimen was collected near Missoula, Montana, as late as 1900. Today, sage-grouse distribution is more restricted in Montana, South Dakota, and North Dakota and is found on two National Forests i.e., Custer NF and Beaverhead-Deerlodge NF.

Habitat

Healthy, properly functioning sagebrush communities support sage-grouse and a variety of other native wildlife. Sagebrush communities in each of the sagebrush ecotypes are influenced by a variety of environmental variables. Among these variables are soil texture, moisture regime, past fire, past herbicide spraying, topography, grazing history, grazing accessibility, and recent weather pattern. The characteristics of vegetation at any particular site are the result of

superimposed environmental variables. Close examination of a functional sagebrush community reveals these factors at work in the form of a patchwork of shrubs, grasses, and forbs of varying heights, canopy coverage, and species. Individual patches within the landscape can be measured at a microsite level, such as a nest site, or can be extended to include a broader scale that might be used to describe sage-grouse wintering areas. Sage-grouse have adapted to and require this naturally occurring patchwork to meet yearlong survival and reproduction needs (Connelly et al. 2000b).

Sage-grouse select specific habitat characteristics in response to season and life stage. During the spring breeding season, males congregate on display areas to attract females. Lekks are revisited annually and usually comprise clearings surrounded by sagebrush. About two-thirds of sage-grouse nests are located within 2 miles of a lek. Hens generally nest under stands of sagebrush 12-20" or more in height, seeking taller shrubs in a stand for nesting. Grasses and forbs provide additional nest concealment from predators. After eggs hatch, sage-grouse hens seek relatively open sagebrush stands with > 15% grass and forb canopy cover. Insects and succulent forbs provide critical food for young broods. As summer progresses and upland forbs desiccate, hens will move broods to moist sites along drainages, ditches, or irrigated meadows/hay crops. In general, moist areas with standing herbaceous cover, for concealing broods from predators, interspersed with sagebrush grasslands provide high quality brood habitat. Improvements in native grass and forb height and density generally translate into better nest success and brood survival. During late fall and winter, sage-grouse feed almost exclusively on sagebrush. Deep snow conditions force sage-grouse to move to areas of exposed sagebrush both for food and cover. Wintering sage-grouse prefer extensive stands of sagebrush with at least 20 percent canopy cover.

Contiguous large blocks of healthy sagebrush-grassland are best suited for meeting yearlong needs of sage-grouse. Limited seasonal habitats (e.g., nesting cover, brood rearing habitat, winter habitat, etc.) may restrict the abundance, productivity, or occurrence of sage-grouse in a particular area.

Management

Sage-grouse are managed under state authority including the statutory authority to regulate harvest. Legislative mandate designates sage-grouse as an upland game bird (87-2-101,MCA).

FWP, in conjunction with federal land management agencies and conservation groups, monitors prairie grouse populations during spring through census of displaying males on leks. The post-harvest telephone survey provides an estimate of harvest for all upland bird species, trend in hunter numbers, and number of birds by species taken by hunters. FWP uses wings from harvested sage-grouse to estimate composition of the harvest by sex and age.

State-funded cooperative habitat projects have the potential to benefit sage-grouse. In 1987, the Montana Legislature created a process and funding source for FWP to purchase conservation interests in important wildlife habitats through conservation easements and fee title acquisitions. The program generates funding from an earmarked portion of license revenue and provides an innovative tool to protect habitat at the state level. The Upland Game Bird Habitat Enhancement Program was developed through a series of Montana legislative sessions from 1987 to 2001. This program funds habitat enhancements on private and public lands such as vegetation plantings, grazing management systems, and leases. The program has recently helped fund (in combination with the USFWS Landowner Incentive Program) the Montana Sagebrush Initiative, which is a 30 year private land lease program designed to conserve high priority sagebrush grasslands from prescribed fire, herbicide applications, plowing, and other practices intended to reduce or eliminate sagebrush and forbs.

Conservation Concerns

- Conversion of native sagebrush grassland to cropland or nonnative pasture
- Rangeland treatments, i.e. prescribed fire and spraying
- Fragmentation of sagebrush grasslands (e.g., structural developments, roads, urban sprawl)
- Unsustainable domestic livestock grazing practices and associated habitat degradation
- Human disturbance
- Noxious weeds

Conservation Strategies

- Promote conservation of intact sagebrush grassland landscapes.
- Support livestock grazing management that maintains or improves native rangeland integrity and provides standing herbaceous cover, important for nesting and brood rearing.
- Avoid use of rangeland herbicides and prescribed fire.
- Quantify impacts of energy development and determine ways to reduce, eliminate, or mitigate negative effects.
- Continue to inventory sage-grouse leks and wintering areas.
- Develop and implement a lek monitoring strategy that will accurately measure trends in sage-grouse abundance and distribution across their range.
- Develop and implement a habitat monitoring system to determine landscape-level trends in sagebrush-grasslands.
- On a smaller scale, monitor trends in habitat condition (e.g., native rangeland integrity, habitat function, invasive weeds).
- As needed, determine local sage-grouse habitat use and movements.

- Guided by the Montana sage-grouse conservation plan, utilize local working groups, organizations, and agency partnerships to promote and expand sage-grouse conservation.

Management Plans

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Columbian Sharp-tailed Grouse (*Tympanuchus phasianellus columbianus*)

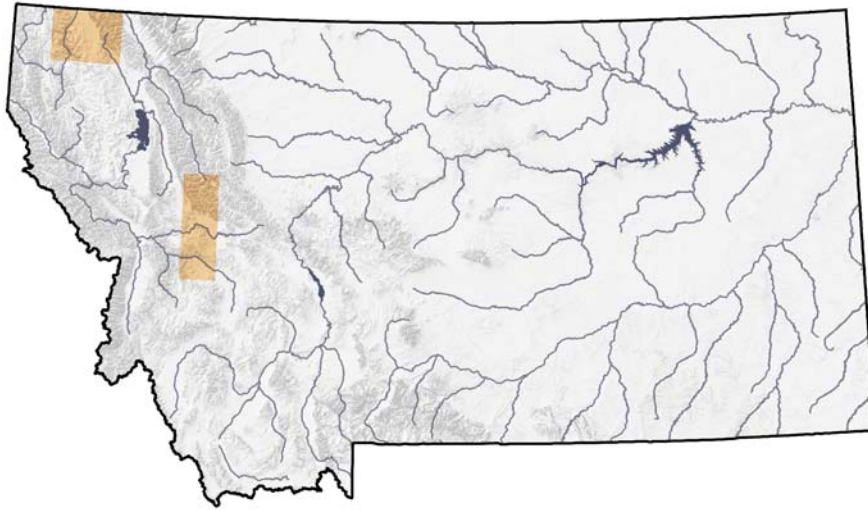


Figure 57. Distribution of the Columbian Sharp-tail Grouse

Range

The Columbian sharp-tailed grouse is one of six recognized subspecies of sharp-tailed grouse that occur in North America (AOU 1957). Historically, the Columbian subspecies ranged in suitable habitats from British Columbia south through eastern Oregon and Washington, Idaho, western Montana, Wyoming and Colorado, and northern Utah, Nevada, and California (Ulliman et al. 1998). There have been significant regional and local declines and extirpations; its geographic distribution has contracted by an estimated 90% (Aldrich 1963, Miller and Graul 1980). Currently, there are three meta-populations of Columbian sharp-tailed grouse: one in Colorado/Wyoming; one in Idaho/Utah; and one in central British Columbia. Smaller population centers are found in south central Idaho/northeast Nevada, north central Washington, and northeast Oregon (USFWS 1999).

Montana recently supported a very small population of Columbian sharp-tailed grouse in the Tobacco Valley near Eureka. Only one dancing ground or lek is known to exist in this area, which is located on land held by the Nature Conservancy. There has been no known use of the lek during the past 3 years (T. Their, pers. comm.). Counts of males on the lek varied from a high of 33 in 1971 to the recent low. This population was supplemented with birds from British Columbia on two occasions.

Flocks of sharp-tailed grouse also occur in the Helmville area of Powell County. These have traditionally been considered Columbian subspecies. Given their geographic nearness to the plains subspecies, however, there may be genetic interchange with plains birds. Although a genetics study has shown similarities

between a very small sample of Helmville birds and sharp-tailed grouse from Washington (Warheit and Schroeder 2001), there does not appear to be conclusive evidence identifying the Helmville birds as the Columbian subspecies.

Habitat

Columbian sharp-tailed grouse are associated with intermountain shrub grassland habitats including sagebrush grasslands and deciduous riparian and foothill shrub habitats. Brood sites are similar to nest sites, but they are usually close to broad-leaved brush patches or shrubby riparian zones. Sharp-tailed grouse need habitat with moderate vegetative cover, high plant diversity, and high structural diversity (Montana Partners in Flight 2004). Tall broad-leaved mountain shrub and riparian cover types are critical components of winter habitat for sharp-tailed grouse (Saab and Marks 1992). They often move to higher elevations to get into moister sites that support greater amounts of these types of shrubs (Ulliman et al. 1998). Suitable winter sites need to be no more than 4 miles from leks to be useful to sharp-tails (Ulliman et al. 1998).

Counting individuals at leks is the easiest way to monitor population trends. Wildlife agencies monitor leks because their size and densities provide an index to populations and indirectly reflect changes in habitat quality (Cannon and Knopf 1981, Giesen and Connelly 1993).

In Montana, Columbian sharp-tailed grouse persist only on native bunchgrass-shrub stands (Mussehl et al. 1971, Montana Natural Heritage Program 2004). In some areas, conversion of native habitats to cropland, unsustainable grazing management, and/or herbicide use has resulted in loss of native grasses, forbs, and woody vegetation, habitat components necessary for providing shelter from winter weather, protection from predators, nesting cover, and food (Mussehl et al. 1971, Montana Natural Heritage Program 2004). Over the past 15 years, much of the historic Columbian sharp-tailed grouse habitat in western Montana has been subject to considerable urban development, resulting in further habitat fragmentation, likely increases in nest-predator abundance, and reduced habitat function. Self-sustaining populations of sharp-tailed grouse require thousands of acres of intact habitat; large blocks of cropland or urban developed habitat are not conducive for supporting sustainable populations (Ulliman et al. 1998). Sharp-tailed grouse habitats associated with the Helmville and Eureka areas are not considered sufficient to support viable populations over the long-term (Montana Partners in Flight 2004).

Management

As there is only one small population of Columbian Sharp-tailed Grouse in Montana, critical efforts must be maintained to encourage individuals to seek and use lek areas. Careful population counts must be made, as well as nesting sites and success.

Conservation Concerns

- Isolated and extremely small population
- Human disturbance to leks
- Conversion of native grassland and shrub/grass communities to agriculture and other unsuitable land uses
- Encroachment of conifers onto grassland habitat
- Unsustainable domestic livestock practices
- Invasion of non-native annual vegetation
- Predation on nests by ravens and other predators

Conservation Strategies

- Protect known lek areas and the surrounding habitats within 2 km. Search for new leks in areas with appropriate physiographic and vegetative characteristics
- Increase abundance and distribution by reintroduction program into Northwest Montana including the development of a captive rearing facility
- Solicit cooperation and communication between land managers and land owners in managing habitat
- Coordinate with British Columbia to manage suitable habitat in the Tobacco Plains area
- Protect, maintain, and enhance winter, breeding, and nesting habitats near known populations
- Monitor existing populations to determine if management actions are adequate
- Avoid pesticide use on Columbian sharp-tailed habitats
- Identify validity of Blackfoot population as Columbian sub-species
- Develop livestock management plans, which favor primarytenance or enhancement of bunchgrass communities, forbs species diversity, and upland shrubs
- Develop appropriate grazing regimes in areas of known populations
- Fence areas of deciduous trees and shrubs (especially in riparian areas) to manage livestock
- Avoid manipulation or alteration of vegetation within the breeding complex (lek and nesting areas) during the nesting period (mid-April – June)
- Prohibit physical, mechanical, and audible disturbances within the breeding complex during the breeding season (March-June), IF they might impact courtship activities and breeding during the daily display period (within 3 hours of sunrise and sunset)
- Use prescribed fire to stimulate growth and vigor of deciduous shrubs in wintering areas, as long as a minimum of 10% of habitat will provide shrub cover during the recovery period of the burned area

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Yellow Rail (*Coturnicops noveboracensis*)

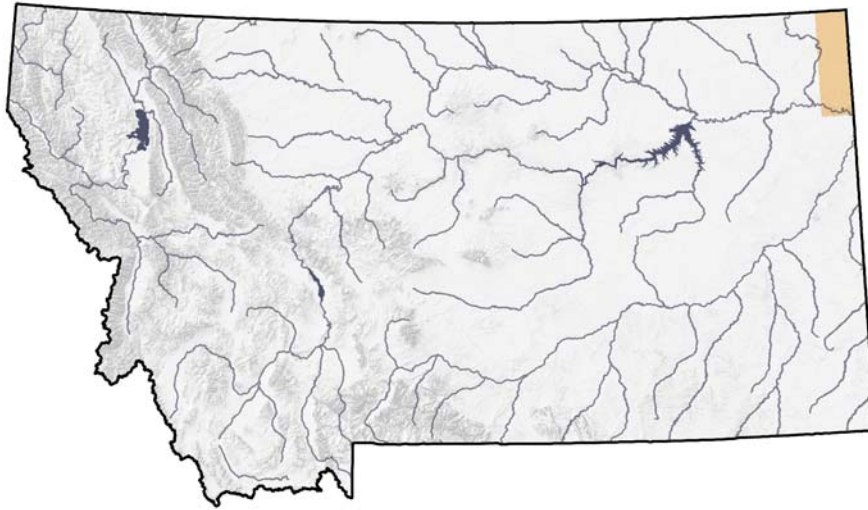


Figure 58. Distribution of the Yellow Rail

Range

With fewer than 20 known observations in the state, this species is considered rare. Wright (1997) indicates that the Yellow Rail is known to occur regularly in the northeastern corner of the state and is rare elsewhere. The first recorded observation in the state was reported in Medicine Lake in 1943. Other sightings of the species have occurred across the state with reports from East Bay of Flathead Lake (the furthest west the species has been reported in the state), Red Rock Lakes, Huntley (Yellowstone County), Bowdoin National Wildlife Refuge, and Westby (Montana Bird Distribution 2003).

Habitat

Breeding habitat selection is similar to that of other locations, and consists of wet sedge (*Carex* spp.) meadows and other wetlands containing grasses, rushes (*Juncus* spp.) and bulrushes (*Scirpus* spp) (Northern Prairie Wildlife Research Center 2003). Presence of the Yellow Rail is most commonly dictated by water depth, specifically one that fluctuates throughout the breeding season, i.e. wet in the early part of the breeding season and relatively dry (no standing water) by July or September (Northern Prairie Wildlife Research Center 2003).

Management

Although no management activities are in place specifically addressing the Yellow Rail in Montana, water level manipulation for other nesting species occurs at most locations where rails are found. Conscious management of water levels for waterfowl could assist in maintaining or enhancing nesting habitat for the

Yellow Rail. Outside of the national wildlife refuges, no activities are known that consider conservation of Yellow Rails. Yellow Rails are a Species of Management Concern in USFWS Region 6 (U.S. Fish and Wildlife Service 1995).

Conservation Concerns

- Little known information in the state
- Human disturbance of wetland habitats
- Water level manipulation at nesting locations

Conservation Strategies

- Increased survey and monitoring projects
- Conservation practices of wetlands
- Manage reservoirs and dammed rivers in a manner that mimics more natural seasonal fluctuations

Management Plans

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Whooping Crane (*Grus americana*)

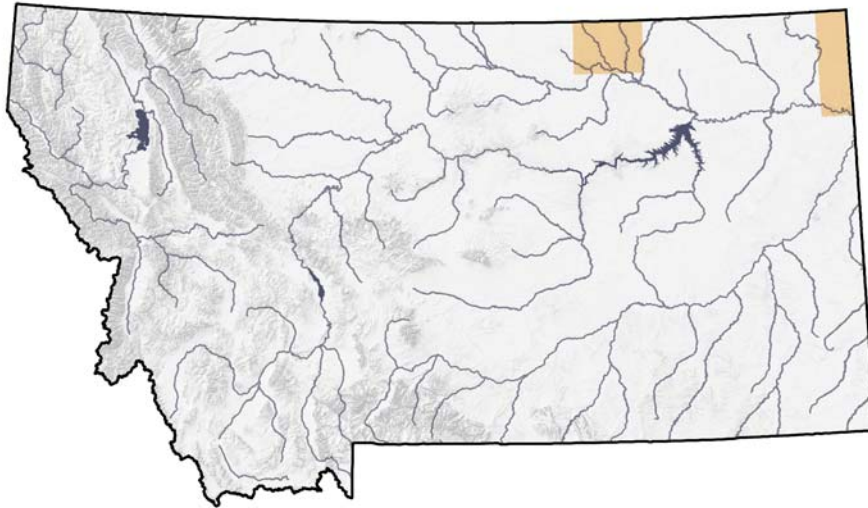


Figure 59. Distribution of the Whooping Crane

Range

Lewis and Clark reported a Whooping Crane in April of 1805 in proximity of what would become Montana and for a long time the sighting was attributed to this state. The observation is now believed, however, to have occurred in North Dakota. The earliest report of a Whooping Crane in the state is thus credited to Maximilian, Prince of Weid, for the observation of a flock of a few individuals above the mouth of the Musselshell River in September 1833 (Skaar, unpublished notes). Skaar (unpublished notes) also indicates that reports of this species for the next ninety years were scarce: singular reports exist for Big Sandy (1903), Terry (1904), and Billings (1918).

Individual, transient Whooping Cranes have been reported throughout the eastern portions of the state, with most of those records for Sheridan (Medicine Lake National Wildlife Refuge) and Roosevelt counties (MBD 2003). Historic observations of the species in the west-central portion of the state are also recorded; those reported the furthest west include observations in Gallatin County (west of Bozeman) in 1967 and Broadwater County (northwest of Townsend) in 1979 (Skaar, unpublished notes). For the past 20 years, observations have been restricted to the northeast corner of the state, with limited sightings of individuals at Red Rock Lakes National Wildlife Refuge. Reports of the birds from Red Rock Lakes are the result of the reintroduction effort to establish a population at Grays Lake, Idaho, which was a non-reproducing flock. The last bird observed at Red Rocks was seen in 2002, and it

is presumed that since the Grays Lake flock is no longer extant, Whooping Cranes will most likely not be seen at Red Rock Lakes until another regional population is established. The birds observed in the eastern corner of Montana are occasional migrants traveling through from the Aransas population on journey to the breeding grounds in Alberta and the Northwest Territories.

Habitat

The Whooping Crane has been observed and breed at or within the marsh habitat present at Medicine Lake National Wildlife Refuge and Red Rock Lakes National Wildlife Refuge. Observations of individual birds in other areas of the state include grain and stubble fields as well as wet meadows, wet prairie habitat, and freshwater marshes that are usually shallow and broad with safe roosting sites and nearby foraging opportunities (MBD 2003).

Management

Efforts continue to protect and restore wetlands in the northeastern corner of Montana, in the area where whooping cranes have migrated in the past. There are also continued efforts to educate crane and waterfowl hunters on the identification of whooping cranes in an effort to avoid accidental harvest.

Conservation Concerns

- Habitat degradation and fragmentation to native prairies
- Human disturbance to nesting locations
- Potential petroleum spills in the wintering areas of Port Aransas
- Human misidentification as sandhill cranes during hunting season

Conservation Strategies

- Habitat conservation in Northeast Montana (outside Medicine Lake NWR)
- Prohibition of public access to breeding locations, including aircrafts
- Hunter education
- Periodic census to evaluate productivity

Management Plans

James A. Kushlan, Melanie J. Steinkamp, Katherine C. Parsons, Jack Capp, Martin Acosta Cruz, Malcolm Coulter, Ian Davidson, Loney Dickson, Naomi Edelson, Richard Elliot, R. Michael Erwin, Scott Hatch, Stephen Kress, Robert Milko, Steve Miller, Kyra Mills, Richard Paul, Roberto Phillips, Jorge E. Saliva, Bill Sydeman, John Trapp, Jennifer Wheeler, and Kent Wohl. 2002. *Waterbird Conservation for the Americas: The North American Waterbird Conservation Plan*, Version 1. Waterbird Conservation for the Americas, Washington, D.C. U.S.A., 78 pp.

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8142

Piping Plover (*Charadrius melodus*)

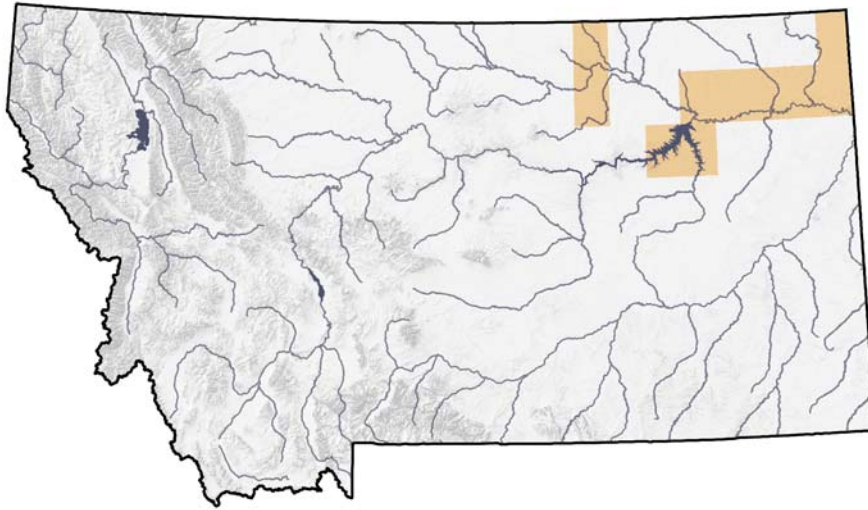


Figure 60. Distribution of the Piping Plover

Range

Piping Plovers are limited to the open shorelines of freshwater or alkaline lakes, reservoirs, rivers, or wetlands. The Piping Plover is generally a species of northern and northeastern Montana. This species is known to breed in Medicine Lake National Wildlife Refuge, Sheridan County, the Missouri River below Fort Peck Dam, Fort Peck Reservoir, Nelson Reservoir, Bowdoin National Wildlife Refuge (occasionally), and Alkali Lake (MPPRC 1994, Montana Bird Distribution 2003).

Observations of non-breeding individuals have been recorded at Freezeout Lake Wildlife Management Area, the south end of Canyon Ferry Reservoir, and Park County (MPPRC 1994, Montana Bird Distribution 2003), though it is presumed the species uses other appropriate habitat in the state during migration.

The Piping Plover usually arrives in Montana in early May and leaves the state by late August. The earliest reported observation dates for the species are for April (28 April 1993, Fort Peck Reservoir [MPPRC 1994], 2001; Upper Goose Lake, Sheridan County; [Montana Bird Distribution 2003]). Most of the observations reported in the state are for breeding individuals, or for activity that suggests breeding.

Reports of Piping Plovers during migration are not common, but do occur just east of the Rocky Mountains (Montana Bird Distribution Committee 1996). Although they were known to breed at Bowdoin National Wildlife Refuge and at Fort Peck Reservoir, little attention was paid to the species prior to its listing in

1985. As a result, few observations prior to 1985 are recorded (Montana Bird Distribution 2003).

Habitat

Piping Plovers primarily select unvegetated sand or pebble beaches on shorelines or islands in freshwater and saline wetlands. Vegetation, if present at all, consists of sparse, scattered clumps (Casey 2000). Open shorelines and sandbars of rivers and large reservoirs in the eastern and north-central portions of the state provide prime breeding habitat (MFWP 2003). In Montana, and throughout the species' range, nesting may occur on a variety of habitat types. If conditions are right, alkali wetlands, lakes, reservoirs, and rivers can all provide the essential features required for nesting. The alkali wetlands and lakes found in the northeastern corner of the state generally contain wide, unvegetated, gravelly, salt-encrusted beaches. Rivers that flood adequately can supply open sandbars or gravelly beaches, as can large reservoirs, with their shoreline beaches, peninsulas, and islands of gravel or sand (USFWS 2003).

Sites with gravel substrate provide the most suitable sites for nesting (MPPRC 1994). One of the most limiting factors to nesting site selection is vegetation encroachment; Piping Plovers avoid areas where vegetation provides cover for potential predators. Fine-textured soils are easier to treat mechanically than rocky or gravelly soils when vegetation is determined as a limiting factor in an area's ability to provide suitable nesting habitat, but fine soils are not typically a preferred nesting substrate (MPPRC 1994). Another, and more important limiting factor in nest site selection is the location of nesting sites in relation to surrounding water levels. Nests are often inundated because water levels are kept unnaturally high throughout the breeding season (and high winds can cause nests to be flooded), or nesting sites are not available, either because of encroaching vegetation or because water levels are so high that beaches are under water during the early part of, and possibly throughout, the nesting season (MPPRC 1994). Nests are simple scrapes dug into the nest substrate, which may or may not be lined with pebbles (MPPRC 1994, 1995, Haig 1992).

Management

Four specific geographic areas recognized as providing critically important habitat and identified as essential for the conservation of the species, have been designated as "Critical Habitat Units" in Montana. The designation of critical habitat may require federal agencies to develop special management actions affecting these sites. The four units include prairie alkali wetlands and surrounding shoreline; river channels and associated sandbars and islands; and reservoirs and inland lakes with associated shorelines, peninsulas, and islands (USFWS 2003). Piping Plovers rely on these places for courtship, nesting, foraging, and brood rearing. The first, Unit 1, contains alkali lake and wetland habitat found in Sheridan County. Unit 2 is identified as riverine habitat and

includes the Missouri River just south of Wolf Point to the state line, encompassing habitat provided by the sparsely vegetated sandbars, and sandy or gravelly beaches along this stretch of the river. Reservoirs, which include similar sandbars and sandy or gravelly beach habitat, define both Units 3 and 4. Unit 3 includes Fort Peck Reservoir, from south of the dam to and including approximately 26 miles (north to south distance) of the length of Dry Arm. Portions of Bowdoin National Wildlife Refuge, the majority of Lake Bowdoin and the western portion of the Dry Lake, were designated as Unit 4. Piping Plovers nest at Nelson Reservoir north of Bowdoin National Wildlife Refuge, but are not contained within any of the Critical Habitat Units in the state. This reservoir was excluded from the critical habitat designation because of a Memorandum of Understanding between the Bureau of Reclamation, the U.S. Fish and Wildlife Service, and the local irrigation districts. The memorandum, in combination with a biological opinion from the USFWS, guides management actions at this location (USFWS 2003). Management activities include moving nests upslope from areas where flooding of nests is imminent; using nest cages over nest bowls to prevent trampling and predation by avian predators; signing beaches to indicate nesting; beach enhancement (grading or burning unwanted encroaching vegetation); raising island elevation to make room to move nests in years with rising water during the nesting season; the release of captive-reared plovers (Erickson and Prellwitz 1999); and timing spring flow releases from Fort Peck Dam to more closely mimic the natural seasonal flows of the river (MFWP 2003). Other management activities to enhance habitat or affect better protection for this plover include building structures (weirs) to contain water in reservoirs for longer periods during the breeding season, placing gravel on otherwise muddy beaches to create appropriate substrate (Hanebury, personal communication 2003), and reducing human, dog, and vehicular disturbance during nesting (MFWP 2003). The greatest threat to nesting plovers is the loss of nesting sites by high water levels at any time of the year, but especially during the nesting season for it can result in inundation of existing nests (MPPRC 1994). Rising water levels later in the nesting season result in decreasing overall island size, and may assist avian predators to locate nests more easily (Erickson and Prellwitz 1999). These conditions enforce the need to manage reservoirs and dammed rivers in a manner that mimics more natural seasonal fluctuations.

Conservation Concerns

- Destruction and degradation of summer and winter habitat
- Shoreline erosion
- Human disturbances of nesting and foraging birds
- Predation

Conservation Strategies

- Protection of as much existing native prairie as feasible, primarily by conservation easement

- Restoration of drained wetlands
- Increase nesting substrate when it appears to be a limiting factor affecting use of wetlands
- Avoid oil and gas development near wetlands
- Direct predator management

Management Plans

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Mountain Plover (*Charadrius montanus*)

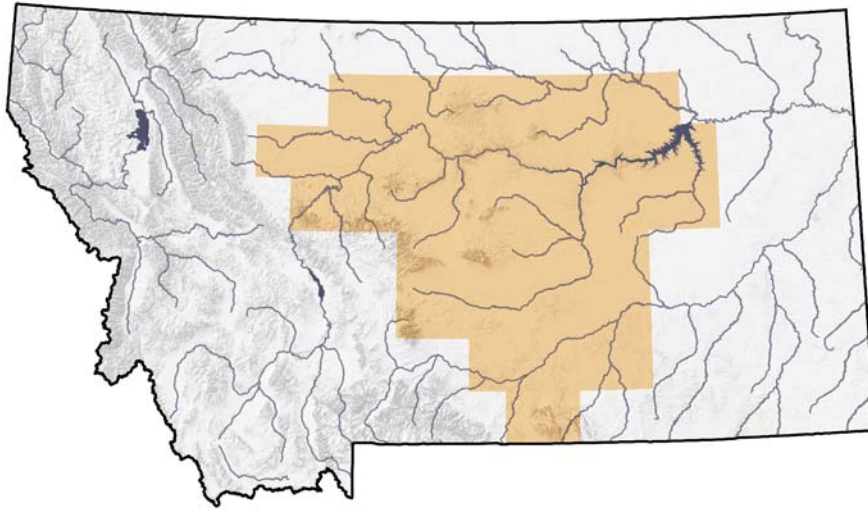


Figure 61. Distribution of the Mountain Plover

Range

Primary breeding habitat of the Mountain Plover is found in the north-central portion of the state in Phillips, Blaine, and northern Fergus and Petroleum counties (FaunaWest 1995). This area contains the largest population of Mountain Plovers in Montana, with additional breeding areas in the state in Valley County (Little Beaver Creek) in the northeastern portion of the state; in Wheatland, Golden and Musselshell counties near the Little Belt, Big Snowy, and Little Snowy Mountains in central Montana; and, in the southwestern portion of the state in Jefferson, Madison and Broadwater counties (FaunaWest 1995). Additionally, surveys in 2003 revealed Mountain Plovers in Big Horn, Carbon, Fergus, Hill, Petroleum, Rosebud, and Treasure counties (Fed. Reg. 68).

Mountain Plovers arrive in April and may remain in the state until September (Johngard 1986). The species is a rare migrant west of the Continental Divide, but is a breeding resident of the prairie lands to the east.

Habitat

Habitat use in Montana appears similar to other areas within the species global breeding range; use of prairie dog colonies and other shortgrass prairie sites are confirmed as preferred breeding habitat. Records indicate the species utilizes towns of both white-tailed (*Cynomys leucurus*) and black-tailed prairie dogs (*Cynomys ludovicianus*) (MBD 2003). Prairie dog towns provide greater horizontal visibility, a higher percentage of bare ground, more burrows for refuge, and higher diversity of forbs than adjacent areas (Olsen 1985). Mountain Plovers will use towns as small as 3 ha (Knowles et al. 1982), but the average on one

study was 57.5 ha (Knowles and Knowles 1984) and ranged from 6 to 50 ha in another (Olson-Edge and Edge 1987).

Primary habitat use in Montana during the breeding season includes heavily grazed, shortgrass prairie sites. Habitat in Phillips and Blaine counties, the area containing the largest known populations of Mountain Plover in the state, is dominated by the native plant species *Bouteloua gracilis* and *Koeleria cristata*. This area also contains *Stipa comata*, *Agropyron smithii*, *Carex* spp., *Artemisia frigida*, *Opuntia polyacantha*, and *Gutierrezia sarothrae* (FaunaWest 1991). Knowles (1993) determined in the northeastern portion of the state, Mountain Plover also selected sites associated with habitat dominated by *Atriplex gardneri* and *Eriogonum multiceps*, while use in the central and southwestern areas of the state was associated with *Bouteloua gracilis* and *Stipa comata*. Strong preference was also given to sites with slopes less than 5% and grass height of less than 6 cm (3 inches) (Knowles, Maj, and Hinckley 1995). Knowles (1993) indicates that sites selected within these habitat types were restricted to areas intensively grazed by prairie dogs, sheep, and/or cattle, especially those of the *Stipa comata* and *Bouteloua gracilis* habitat type (Knowles and Knowles 1997).

Management

No coordinated management activities in Montana specific to Mountain Plover were identified. However, the unifying habitat features desirable to Mountain Plovers are extremely short vegetation, a high percentage of bare soil, and an extensive area (0.5 to 1 km diameter) of nearly level terrain (Knowles and Knowles 1997). Management practices should emulate these parameters ensure that these populations persist. Several studies have suggested specific conservation actions that could be taken to benefit Mountain Plover habitat (Wershler 1989; FaunaWest Wildlife Consultants 1991; Knopf 1991; Carter and Barker 1993; U.S. Fish and Wildlife Service 1995).

Conservation Concerns

- Loss of livestock grazing (increase in vegetation height above 4 inches or 30% cover)
- Invasive non-native plant species
- Habitat loss of shortgrass prairies due to conversion to cropland

Conservation Strategies

- Cooperate with resources users in order to support sustainable domestic livestock practices that promote Mountain Plover habitat
- Shrub and noxious weed encroachment should be controlled at known and potential breeding sites
- Existing native grassland should be protected from conversion to cropland

Management Plans

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Long-billed Curlew (*Numenius americanus*)

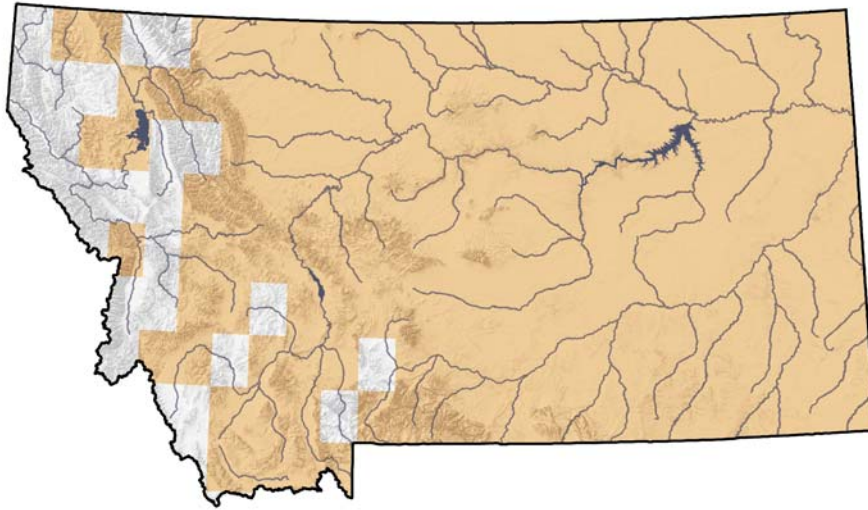


Figure 62. Distribution of the Long-billed Curlew

Range

The Long-billed Curlew breeds widely throughout the state, although it is more common east of the Rocky Mountains. Long-billed Curlews do not overwinter in the state.

Habitat

Long-billed curlews have four essential nesting habitat requirements in the northwestern United States: short grass (less than 30 cm, 11.8 in tall), bare ground components, shade, and abundant invertebrate prey. Long-billed curlews prefer native prairies but also occupy grazed mixed-grass communities and scrub prairies. Long-billed curlews probably select sites because of shortness of vegetation and also the spacing of grass clumps. Because they rely on camouflage for protection of their eggs and themselves during incubation, the short grass presumably allows for better visibility of approaching danger, and the irregular pattern of grass clumps complements their cryptic coloration. They typically prefer areas with well drained, gravelly soils, and low, rolling terrain. Proximity to water may be another important factor in breeding habitat.

Management

Long-billed curlews are closely associated with grassland and shrub grassland habitats. Management should therefore be directed at protection and enhancement of those habitats. Of primary importance is the prevention of the conversion of upland prairie to cropland and the protection of known breeding habitat of curlews from detrimental human activities such as vehicular use,

researcher disturbance, and shooting. Habitat areas need to be >3 times as large as a long-billed curlew territory, which averages about 14 ha (34.6 acres), in order for curlews to use them. Removing tall, dense residual vegetation before the pre-laying period will improve breeding habitat in overgrown areas. Removal of residual vegetation is especially important after years of above-normal precipitation. Haying and grazing can be used to provide the short vegetation and reduced vertical plant density preferred by nesting curlews but should be timed so that short vegetation is available early in the season. In southwestern Idaho, curlews avoided areas that had not been grazed within the past year. Prescribed burns can improve habitat by reducing shrub coverage and increasing habitat openness. During the breeding season following a fall range fire in western Idaho, the estimated curlew breeding density increased 30%. Grazing should be avoided during the incubation period as trampling can reduce hatching success. In known breeding areas, pastures and hay fields should not be dragged to break up cowpies as long-billed curlews often nest near cowpies. Dragging may be acceptable if it occurs after the breeding season when eggs or chicks are no longer vulnerable.

Conservation Concerns

- Habitat loss (e.g. sodbusting, weed invasion, general conversion of prairie lands to other uses)
- Breeding habitat within state is either fragmented, unprotected, or mismanaged
- Human-directed disturbance to grassland habitats (disturbance includes impacts of cattle grazing, roads, adjacent land activities, and may include pesticide application, draining of wetlands)

Conservation Strategies

- Provide large blocks of suitable habitat
- Management activities, and grazing should be delayed until after the breeding season (approximately July 15)
- Maintain vertical structure through appropriate management techniques such as light grazing, and occasional prescribed burning
- Prevent sodbusting, subdivision, conversion of prairie lands to other land uses

Management Plans

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Interior Least Tern (*Sterna antillarum athalassos*)

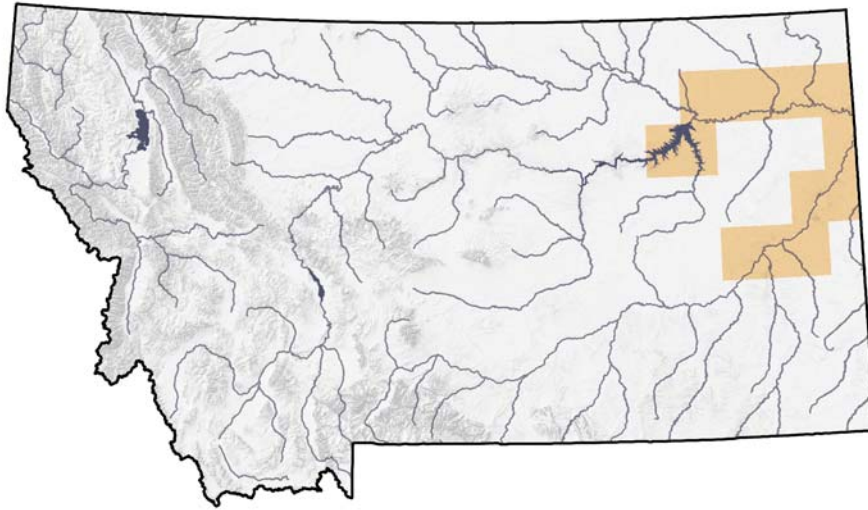


Figure 63. Distribution of the Least Tern

Range

Montana defines the western portion of the Interior Least Tern's range. The species breeds along the lower portions of the Missouri River below Fort Peck Dam, on the beaches of Fort Peck Reservoir, and on the Yellowstone River below Glendive. Records of transient individuals are few and are limited primarily to these same areas (Montana Bird Distribution 2003).

Habitat

Interior Least Terns nest on unvegetated sand-pebble beaches and islands of large reservoirs and rivers in northeastern and southeastern Montana, specifically the Yellowstone and Missouri river systems (Christopherson et al. 1992). These wide-open river channels, and lake and pothole shorelines provide the preferred characteristics for nesting terns. Sites with gravel substrate provide the most suitable sites for nesting (MPPRC 1994). One of the most limiting factors to nesting site selection is vegetation encroachment; terns avoid areas where relatively thick vegetation provides cover for potential predators. Fine-textured soils are easier to treat mechanically than rocky or gravelly soils when vegetation is determined as a limiting factor in an area's ability to provide suitable nesting habitat, but fine soils are not typically a preferred nesting substrate (MPPRC 1994).

In Montana, as in other areas, another and more important limiting factor in nest site selection is the location of nesting sites in relation to surrounding water levels. Nests are often inundated because water levels are kept unnaturally high throughout the breeding season (and high winds can cause nests to be flooded)

or nesting sites are not available (either because of encroaching vegetation or because water levels are so high that beaches are under water during the early part of, and possibly throughout, the nesting season) (MPPRC 1994).

Management

As identified in the Recovery Plan for the Interior Least Tern, delisting can be considered when four censuses confirm that the interior population has reached 7,000 and remains stable for at least 10 years. The goal for the Missouri River system is 2,100 birds (census numbers in 2003 revealed 735 birds for the Missouri River in total; Pavelka, Pers. Comm. 2003). Appropriate water management, that which includes natural seasonal flows, is identified as the major consideration for Interior Least Tern conservation in Montana, for the greatest threat to breeding pairs, in some years, is the loss of existing nesting sites from inundation by high water during the breeding season (MPPRC 1994). Rising water levels late in the nesting season can also reduce overall island size, and may result in assisting local avian predators to locate tern nests (containing eggs or nestlings) more easily (Erickson and Prellwitz 1999). These conditions reinforce the need to manage reservoirs and dammed rivers in a manner that mimics more natural seasonal fluctuations for the protection of Interior Least Tern populations. Other management activities beneficial to the species include: instituting grazing management practices more appropriate to the conservation of the Interior Least Tern; controlling access to key nesting locations; moving nests upslope from areas where flooding of nests is imminent; relocating eggs to nests of other terns for foster incubation; signing of beaches to indicate nesting by Interior Least Terns (though in areas where there is hostility toward the species, or toward listed species in general, this is not recommended); beach enhancement (grading or burning to remove unwanted encroaching vegetation); raising island elevation to make room to move nests in years with rising water during the nesting season (MPPRC 1994); and timing spring flow releases from Fort Peck Dam to more closely mimic the natural seasonal flows of the river (MFWP 2003). Other management activities to enhance habitat or affect better protection for this species includes reducing human, dog, and vehicular disturbance during nesting (MFWP 2003).

Conservation Concerns

- Human use and predation on adults, eggs, and young by birds (e.g., kestrels, night-herons, crows, northern harrier, gulls) and mammals (foxes, skunks, weasels, opossum, rats, feral hogs, and domestic cats and dogs)
- Chemical spills and pesticide or heavy metal pollution
- Human modification of river flow (e.g., reduction of spring floods by dams) and bank stabilization and channelization, resulting in reduced availability of bare island/sandbar nesting habitat
- Loss of aquatic habitat diversity and resulting changes in fish species composition and abundance

- Unsustainable irrigation may be a threat by lowering water levels/flows and reducing river areas when terns are breeding

Conservation Strategies

- Decrease human modifications of flows on larger rivers
- Decrease point and non-point inputs of pesticides and heavy metals into rivers and floodplains
- Conservation of riparian areas in Northeast Montana, decreasing human impacts

Management Plans

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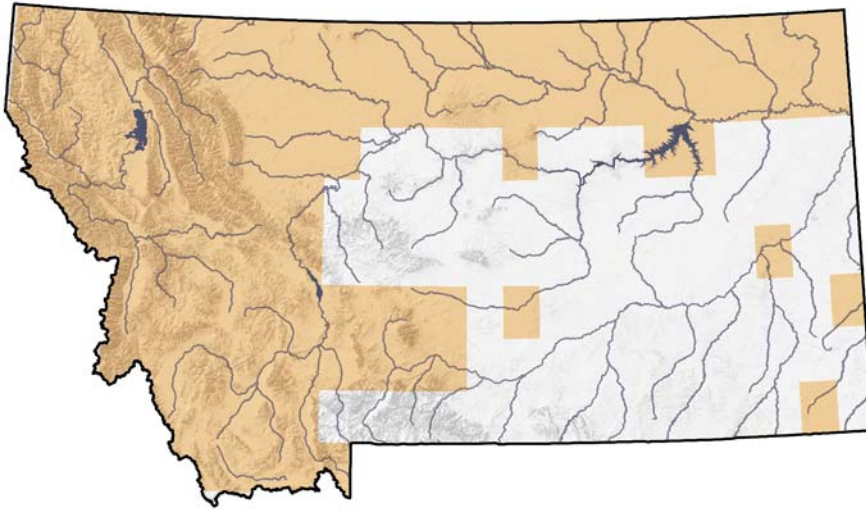
Black Tern (*Chlidonias niger*)

Figure 64. Distribution of the Black Tern

Range

Black Terns have been documented breeding in 12 Montana counties; most located in the northern half of the state. From east to west they include Sheridan, Phillips, Blaine, Cascade, Teton, Ponderosa, Glacier, Powell, Flathead, and Lake counties. Breeding records also exist for Beaverhead County in southwest Montana and Carter County in the southeast corner of the state.

Unconfirmed breeding has also been recorded in at least five more counties (Montana Bird Distribution 2003, MTNHP 2003). Even though breeding Black Tern colonies are located throughout many areas of Montana, this apparent wide-ranging distribution is misleading. Black Terns are limited to breeding locations with appropriate habitat, size and vegetative composition. These limitations likely account for their widely scattered distribution. Black Terns can nest wherever appropriate habitat exists, but appropriate habitat in Montana is patchy at best.

Little information is known about Black Tern migratory patterns in Montana. They are more likely to move north from wintering locations through the interior of the U.S. (Dunn and Argo 1995), so early sightings should occur in southern portions of the state. Migrating Black Terns have been observed just north of Dillon as early as April. However, the majority of spring migration observations have been in May and June. Black Terns have been observed in transit in July and August albeit fewer observations, probably due to peak breeding. The latest recorded observation was in September near Medicine Lake National Wildlife Refuge in Sheridan County (Montana Bird Distribution 2003). Migration in fall is less

concentrated through the interior of the country as birds also move to coastal areas (Dunn and Argo 1995).

Habitat

Black Tern breeding habitat in Montana is mostly wetlands, marshes, prairie potholes, and small ponds. However, several locations are on man-made islands or islands in man-made reservoirs. Across all Montana sites where Black Terns are present, approximately 30%-50% of the wetland complex is emergent vegetation. Vegetation within known breeding colonies includes alkali bulrushes, canary reed-grass, cattail spp., sedge spp., rush spp., reed spp., grass spp., *Polygonum* spp., *Juncus* spp. and *Potamogeton* spp., indicating a wide variety of potential habitats are usable by Black Terns. Water levels in known breeding localities range from about 0.5 m to greater than 2.0 m with most having depths between 0.5 m and 1.0 m (MTNHP 2003).

Management

Active management for Black Terns in Montana is currently limited to continued population monitoring and water level fluctuation control. Several Black Tern colonies are under federal or state control and monitoring of the population at those locations is completed annually. This monitoring can range from basic observation counts to nest location surveys. At some sites, federal or state agencies also monitor and regulate water levels during the breeding season for Black Terns, as well as other wetland species and waterfowl. Both population monitoring at perennial breeding locations and water level regulation should be continued on an annual basis and be expanded to other locations where Black Terns breed in the state.

Conservation Concerns

- Loss or degradation of wetlands for breeding and migration
- Pesticide reduction of favored insect foods
- Human disturbance in nesting colonies
- Lack of information

Conservation Strategies

- Implement a public education and sighting program, similar to the program for Common Loon nesting sites
- Undertake continued management actions at waterfowl management areas to reduce salinity and selenium concentrations
- Reduce nutrient loading from runoff at known Black Tern nesting sites
- Incorporate Black Tern habitats (known and potential) into any wetland restoration programs
- Continue monitoring at breeding locations

Management Plans

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Flammulated Owl (*Bufo boreas*)

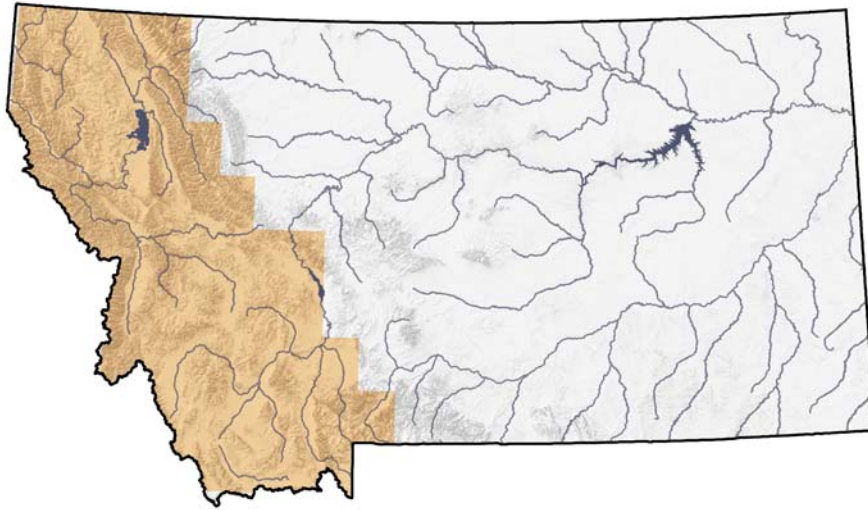


Figure 65. Distribution of the Flammulated Owl

Range

The range of Flammulated Owls in Montana is restricted to the western portion of the state, which includes areas east of the continental divide. Montana Bird Distribution notes eight observation records since 1996, with confirmed breeding in the Bitterroot Valley (Lenard et al. 2003). Additional breeding occurrences are confirmed in the Helena, Missoula, and Bozeman areas (Montana Bird Distribution online database 2001). Other areas of suspected breeding occur throughout western Montana. Low elevation, old growth ponderosa pine are especially important for flammulated owls.

Habitat

Information on breeding habitat in Montana is limited to one study in the Bitterroot Valley (Wright 2000). In Montana, Flammulated Owls are associated with mature and old-growth xeric ponderosa pine/Douglas-fir stands (Holt and Hillis 1987, Wright et al. 1997) and in landscapes with higher proportions of suitable forest and forest with low to moderate canopy closure (Wright et al. 1997). They are absent from warm and humid pine forests and mesic ponderosa pine/Douglas-fir (McCallum 1994a, Wright et al. 1997). Information gathered from other studies throughout their range suggest the breeding habitat of Flammulated Owls is montane forest; usually open conifer forests containing pine, with some brush or saplings (typical of the physiognomy of pre-European settlement ponderosa pine forests). The species shows a strong preference for ponderosa pine (*Pinus ponderosa*) and Jeffrey pine (*P. jeffreyi*) throughout its range (McCallum 1994b). They prefer mature growth with open canopy avoiding dense young stands. Flammulated Owls are found in a cooler, semi-arid climate, with a

high abundance of nocturnal arthropod prey and some dense foliage for roosting (McCallum 1994a). Most often they are found on ridges and upper slopes (Bull et al. 1990, Groves et al. 1997).

In British Columbia, Flammulated Owls use dry interior Douglas-fir (*Pseudotsuga menziesii*) where ponderosa pine may be a co-dominant, but pure ponderosa pine is avoided. Also sometimes they are in pure aspen and, locally, in spruce (*Picea* sp.)/Douglas-fir and lodgepole pine (*Pinus contorta*)/Douglas-fir. They prefer forests dominated by trees more than 100 years old. The highest densities are found in 140 year-old to more than 200 year-old forests; owls were restricted to forests with multi-layered canopies with an abundance of large, well-spaced trees interspersed with grassy openings up to 2 hectares in size, and where cavity-bearing snags were "moderately common" (Howie and Ritcey 1987, van Woudenberg 1999). A study in the Kamloops area testing a habitat model in Douglas-fir/ponderosa pine found three variables to be significant predictors for occupied habitat: elevation (between 850 and 1,150 meters), age class (older stands), and canopy closure (40 to 50 percent) (Christie and van Woudenberg 1997).

In Idaho, they are found mostly in mature stands of ponderosa pine, Douglas-fir, or mixtures of the two with relatively open canopies (Atkinson and Atkinson 1990), occasionally in stands of pure Douglas-fir or aspen where ponderosa pine is absent. Sixty-five percent of detections were on upper slopes or ridges. Tree densities were approximately 500 per hectare and the mean DBH (diameter at breast height) for all trees was 32 centimeters (Groves et al. 1997). One nest cavity, excavated by a Northern Flicker, was in a 6.5 meter tall, 34 cm dbh, Douglas-fir snag (Atkinson and Atkinson 1990). In northeast Oregon, nest trees were located in stands of old-growth ponderosa pine or mixed conifers near small clearings (Bull and Anderson 1978). In Colorado, they show strong preference for old-growth ponderosa pine and Douglas-fir, using older trees for foraging and singing (Reynolds and Linkhart 1992, Linkhart and Reynolds 1997).

Territories consistently occupied by breeding pairs were those containing the largest portion (more than 75 percent) of old-growth (200 to 400 years), whereas territories occupied by unpaired males and rarely by breeding pairs contained 27 to 68 percent old-growth (Linkhart and Reynolds 1997). Aspen (*Populus tremuloides*) is often a component of nesting habitat in Colorado and Nevada (Reynolds and Linkhart 1987b, McCallum 1994b). In northern Utah, the species has successfully nested in nest boxes in montane deciduous forests dominated by aspen with some scattered firs (Marti 1997).

Flammulated Owls prefer to forage in yellow pine and/or Douglas-fir, and these forest types apparently support a particular abundance of favored lepidopteron prey (McCallum 1994b). In Oregon, they forage in ponderosa pine and Douglas-fir types with low to medium stem density, but show particular preference for forest/grassland ecotones (Goggans 1986, cited in McCallum 1994b). In

Colorado, they preferred to forage in old-growth (more than 200 years), which was related both to an abundance of lepidopteron prey and to the open crowns and park-like spacing of trees which allowed greater room to maneuver for the owls (Reynolds et al. 1989). The species may focus foraging in a few "intensive foraging areas" within the home range, averaging 1 hectare per range (Linkhart 1984, cited in McCallum 1994b).

Flammulated Owls roost in dense vegetation and thickets that provide shade and protection from predators. They often roost close to trunks in fir or pine trees, or in cavities (McCallum 1994b, USDA Forest Service 1994). In Oregon, they use mixed coniferous forest rather than pure ponderosa pine (Goggans 1986, cited in McCallum 1994a). In Colorado, large Douglas-firs or pines with a spreading form are used (Linkhart 1984, cited in McCallum 1994a). They roost close to nests (20 to 25 meters) during the nestling stage and just before fledging, and farther away before and after (McCallum 1994a). In British Columbia, Flammulated Owls roosted in regenerating thickets of Douglas-fir (Howie and Ritcey 1987). Migration habitat is in wooded and open areas in lowlands and mountains, including riparian areas and breeding habitat (McCallum 1994a).

McCallum (1994a) and Hayward and Verner (1994) provide substantive reviews of flammulated owl habitat, behavior, and general ecology. Breeding habitat is primarily ponderosa pine or forest with similar characteristics, e.g., dry montane coniferous forest or aspen forests, with brushy understory or open grasslands nearby. The preferred breeding habitat hosts a high diversity or abundance of nocturnal arthropods (primarily insects). Prey availability appears to be the primary factor for migration and patterns in migration and winter habitat requirements are poorly known.

Atkinson and Atkinson (1990) report territorial owls preferred relatively open, multistoried Douglas-fir, ponderosa and mixed conifer stands with some mature trees present. Territories often were near relatively open areas, natural openings, clearcuts, old burns, or grassy hillsides. Wright (1996) in the Bitterroot and Sapphire Mountains in west central Montana found flammulated owls in the breeding season related to the presence of snags and large trees near a nest area, openings at the territory scale, and the presence of low or moderate canopy closure in stands of ponderosa pine or Douglas-fir with a mosaic of grass/shrubs and forest edge.

Management

No specific management activities for Flammulated Owls are currently occurring in Montana, however, management for old-growth ponderosa pine habitats is ongoing by a number of land management agencies. Management for the primarytenance of this habitat type will be beneficial for Flammulated Owls in Montana.

Conservation Concerns

- Loss of old-growth forests
- Inadequate monitoring efforts
- Found in cluster distributions so that one catastrophic event could lead to loss of population
- Fire suppression
- Use of herbicides or insecticides near nests

Conservation Strategies

- Conservation of old-growth forests
- Continue monitoring efforts
- Habitat management geared toward the restoration of pre-European settlement habitat structure
- Evaluate the quality and quantity of suitable but unoccupied habitat or habitat that would be suitable with restoration
- Do not use insecticides near nest sites
- Consider use of prescribed fire near mature forest stands to reduce understory stocking and enhance the shrub component

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Burrowing Owl (*Speotyto cunicularia*)

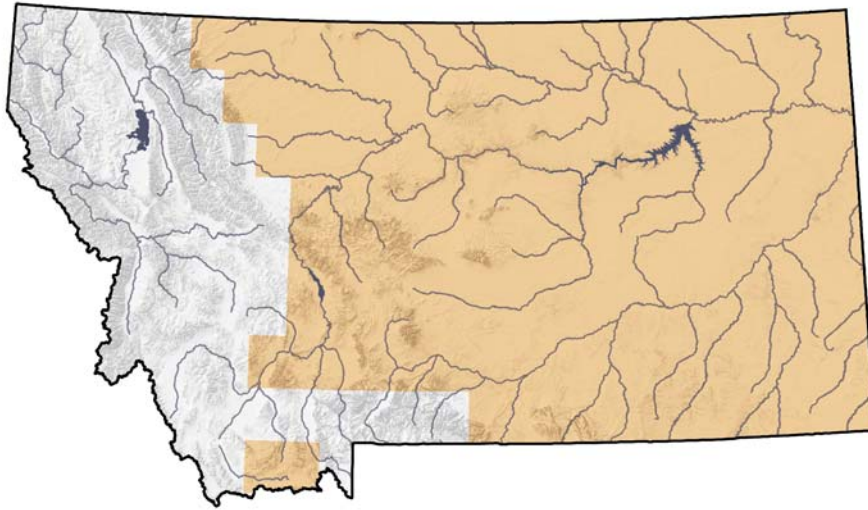


Figure 66. Distribution of the Burrowing Owl

Range

Burrowing Owls continue to be widely distributed in appropriate habitat east of the Continental Divide (Lenard et al. 2002).

Habitat

The Burrowing Owl breeds in open grasslands (Orth and Kennedy 2001) to savanna and in some areas of human habitation (e.g. airports, golf courses, road rights-of-way) (Jones and Bock 2002). Areas used for breeding are often associated with burrows created by small mammals (e.g., prairie dogs, badgers, yellow-bellied marmots, and others) (Haug et al. 1993).

Presence of burrows is a critical habitat requirement and are often found in open grasslands, abandoned by mammals. In Montana, Black-tailed prairie dog (*Cynomys ludovicianus*) and Richardson's ground squirrel (*Spermophilus richardsonii*) colonies provide the primary and secondary habitat for Burrowing Owls (Klute et al. 2003). The burrows may be enlarged or modified, making them more suitable. Burrowing Owls spend much time on the ground or on low perches such as fence posts or dirt mounds.

Management

Managers outside of Montana have tried conservation actions such as creating artificial burrows and perches for Burrowing Owls and regulation/protection of burrowing mammals. Successful approaches should be considered.

Conservation Concerns

- Elimination of burrowing mammals that provide critical habitat
- Habitat loss and fragmentation due to agricultural and urban development
- Petroleum exploration and development
- Residual effects of pesticide use
- Nest site disturbance

Conservation Strategies

- Conservation easements and other conservation practices that recover or protect native prairie grassland areas
- Continued monitoring and surveying of burrowing mammals
- Increased education and information to increase awareness of importance of nesting sites and reducing disturbance

Management Plans

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Black-backed Woodpecker (*Picoides arcticus*)

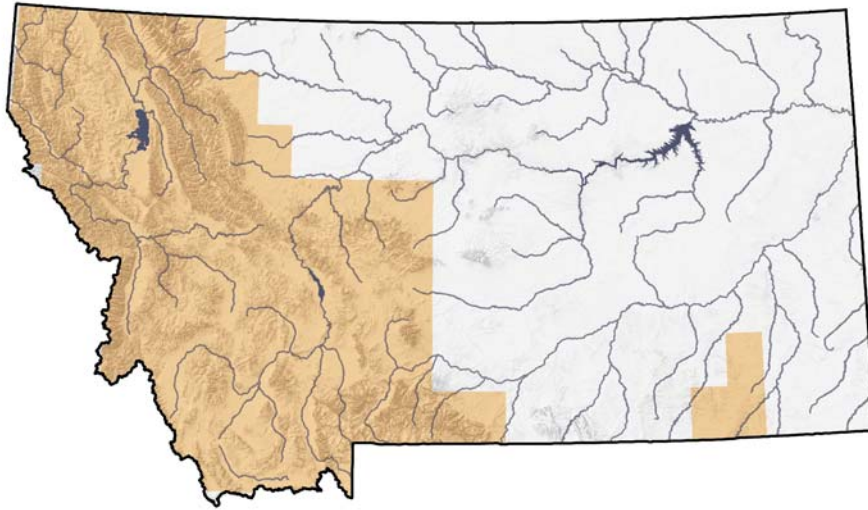


Figure 67. Distribution of the Black-backed Woodpecker

Range

The range of the Black-backed Woodpecker in Montana is primarily confined to the northwest portion of the state. The Montana Bird Distribution (2003) and The Montana Natural Heritage Program (2003) have approximately 16 confirmed breeding records for the species. Except for a single record from the south-central area of the state (southern Park County), all the breeding records are located in northwestern counties (Lincoln, Sanders, Flathead, Missoula, Lewis and Clark, and Powell) (MBD 2003). Unconfirmed, but potential, breeding records also exist for Black-backed Woodpecker and would expand their range to most counties in the western part of the state, including areas in southwestern Montana, the Big and Little Belt Mountains area, and the Bridger Range (MBD 2003). Several unconfirmed breeding records also exist for a small area in southeast (Custer National Forest) Montana (MBD 2003).

The black-backed woodpecker (hereafter referred to as black-backed) breeds from central Alaska and northern Canada south to the mountainous regions of California, Wyoming, Black Hills, Upper Great Lakes and New England states, and into Newfoundland. Like most woodpeckers, they feed on insects living in dead or diseased trees, and hunt for wood boring insects by peeling patches of dead bark.

Habitat

The habitat of Black-backed Woodpeckers in Montana is early successional, burned forest of mixed conifer, lodgepole pine, Douglas-fir, and spruce-fir (Hutto 1995a, 1995b), although they are more numerous in lower elevation Douglas-fir

and pine forest habitats than in higher elevation subalpine spruce forest habitats (Bock and Bock 1974). This is supported by Harris (1982) who found Black-backed Woodpeckers in two recently burned forests comprised of 73% and 77% Douglas-fir, respectively. They appear to concentrate in recently burned forests and remain for several years (3 to 5) before leaving due to prey source decline (Harris 1982). In northwestern Montana, Black-backed Woodpeckers nested in areas of western larch (*Larix occidentalis*) /Douglas-fir forest with a major component of old-growth (McClelland et al. 1979). Harris (1982) found Black-backed Woodpeckers nesting within western larch even though the stand was predominately Douglas-fir. McClelland et al. (1979) determined the decay of heartwood while maintaining a hard outer shell of western larch creates an ideal nesting site for Black-backed Woodpeckers to excavate.

The black-back is thought to be sedentary, but irruptions in winter are known and associated with urban areas overcome with Dutch elm disease (Yunick 1985). Black-backed nests have been monitored in Idaho (burned ponderosa pine forests), Wyoming (burned lodgepole pine forests), Oregon (unburned mixed pine forest with bark-beetle outbreaks), and in Montana (patchily burned mixed conifer forests) (Dixon and Saab 2000). Bent (1939) found more than 75% of the black-back's diet was composed of cerambycids (flatheaded wood borers) and buprestids (round headed woodborers). It is believed the black-backed is able to more effectively extract wood-boring insect larva than other woodpeckers (Kirby 1980).

More detailed information of black-back nest sites, foraging and general behavior and ecology in the breeding season is found in recent published reviews (Dixon and Saab 2000) and in recent peer reviewed literature (McIver and Starr 2001, Hoyt and Hannon 2002).

The value in long-term observations is evident in understanding wildlife habitat relationships (Sergio and Newton 2003). Information in the Montana Heritage Program (through May 2003), Idaho Data Conservation Center (through January 2003) show most black-back nests (n = 14) in Idaho are near (within 1000m) or within insect outbreaks. In Montana, nest site information is lacking but most observations are in or near insect outbreaks or recently burned areas (n = being complied).

Management

No known active management is ongoing for Black-backed Woodpeckers in the state. However, studies from the western United States on the logging of post-fire trees indicated the negative impacts of this activity on Black-backed Woodpeckers (Kotliar et al. 2002). The conclusion reached was that this species rarely used even partially logged post-fire forests. Therefore, when salvage logging is planned, a delay of work for at least five years after the disturbance event is very important (Hutto 1995, Dixon and Saab 2000). This time delay is

essential to provide habitat as the woodpecker's primary prey items (wood-boring beetles) become less abundant after this period (Caton 1996). Salvage operations should retain more than 104 to 123 snags per hectare (more than 42 to 50 snags per acre) that are more than 23 cm diameter at breast height (dbh), more than 9 inches dbh (Dixon and Saab 2000, Wisdom et al. 2000).

Conservation Concerns

- Timber harvest
- Fire suppression
- Removal of fire-killed or insect-infested trees
- Conversion of mature and old-growth forests to young stands with few decayed trees
- Human disturbance near nest sites

Conservation Strategies

- Decrease fire suppression to allow natural occurrences in isolated areas
- Manage "salvage" logging techniques in order to promote sufficient snags
- Insure that fire, insects and wind are allowed to regularly disturb habitat throughout space and time
- Avoid human-related factors that may impact behavior

Management Plan

Casey, D. 2000. Partners in Flight Bird Conservation Plan Montana Version 1.0. Montana Partners in Flight. Kalispell, Montana.

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Olive-Sided Flycatcher (*Contopus cooperi*)

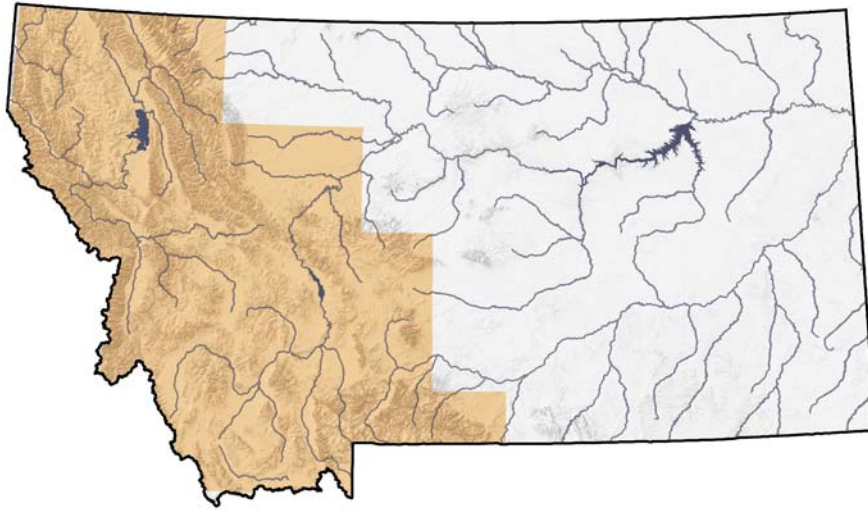


Figure 68. Distribution of the Olive-Sided Flycatcher

Range

The Olive-sided Flycatcher breeds throughout mountainous areas of the western portion of the state with unconfirmed reports of breeding in the central region of Montana (Casey 2000, Montana Bird Distribution 2003). The species' propensity for higher elevations, usually from 920 to 2130 meters, explains the transient nature of individuals reported at locations north and east of Billings (Montana Bird Distribution 2003).

Habitat

A species that generally breeds in the montane and boreal forests in the mountains of western North America, Olive-sided Flycatchers are highly adapted to the dynamics of a landscape frequently altered by fire. They are more often associated with post-fire habitat than any other major habitat type, but may also be found in other forest openings (clear cuts and other disturbed forested habitat), open forests with a low percentage of canopy cover, and forest edges near natural meadows, wetlands, or canyons (Hutto and Young 1999, Altman and Sallabanks 2000). Their affinity for forested edges near water may be a product of a higher presence of flying insects in these areas (Altman and Sallabanks 2000). They are a species common in spruce and aspen (*Populus tremuloides*), but are uncommon in mixed-conifer, ponderosa pine (*Pinus ponderosa*), pine-oak (*Pinus-Quercus*), and cedar-hemlock (*Cupressaceae-Tsuga*) forests, and rarely present in lodgepole pine (*Pinus contorta*) or pinyon-juniper (Hejl et. al. 1995 as cited in Casey 2000).

Olive-sided flycatcher is a contrast species using a mosaic of coniferous old forests for nesting and either openings or gaps in old forests for foraging (Altman and Sallabanks 2000). Current habitat conditions are likely inferior in quantity and quality to historic conditions because of changes in historic fire regimes, but the magnitude of the change is unknown (Wisdom et al. 2000). In unburned forests open-canopy over-story old forest conditions with high contrast early-seral edge habitat within and/or adjacent, and large snags provide for nesting and foraging needs. The species is the only common species detected more often at forest edges than in forest interiors.

The species forages on flying insects aerially from high, exposed perches atop tall trees or snags. Logging practices such as partial harvests, that retain these habitat structures while opening the forest canopy, creating more edge effects and retaining a mosaic of early to late seral habitat conditions appear to benefit the species (Altman and Sallabanks 2000, Casey 2000). Species use declines with the reestablishment of closed canopy forests. The use of fire as a management tool benefits this species, as frequent low intensity burns decrease canopy density. Population densities have been found to increase in habitats that have been opened up by fires. The retention of snags and large trees benefit the species by retaining important foraging and singing perches. Concerns do exist that the dichotomy of increased habitat use of harvested forests and declining populations may indicate that harvested forest types may represent an “ecological” trap for the species.

Management

Management actions in Montana are currently limited by lack of conclusive information about the specific relationship between species' habitat use and reproductive success. It is unclear if stand replacing fire regimes or fires of less magnitude provide more appropriate habitat for successful reproduction (Casey 2000). In areas where fire suppression has reduced the heterogeneity of the forest, fire management techniques that promote a more historic pattern of disturbance would benefit the species (Casey 2000). Several other management techniques to benefit the species include retaining forested habitat around riparian and wetland habitats and retaining snags and large trees post-fire. Select logging practices that retain medium to large trees with a relatively open canopy closure may also provide appropriate habitat (Casey 2000). The Olive-sided Flycatcher is a Species of Management Concern in Region 6 (U.S. Fish and Wildlife Service 1995).

Conservation Concerns

- Fire suppression management
- Decreased of snags and large trees post fire
- Conversion of forest to urban and residential areas

Conservation Strategies

- Selective logging practices
- Retain, maintain and/or restore stands of open-canopy mature and older ponderosa pine and cottonwood, and actively manage to promote their long-term sustainability
- Retention of forested edge habitat around riparian and wetland features
- Use prescribed fire, timber harvest and thinning to change forest composition and structure to restore old open forest conditions
- Identify occupied habitat and evaluate the quality and quantity of unoccupied habitat or habitat that would be suitable with restoration with fire or other action

Management Plans

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Sedge Wren (*Cistothorus plantensis*)

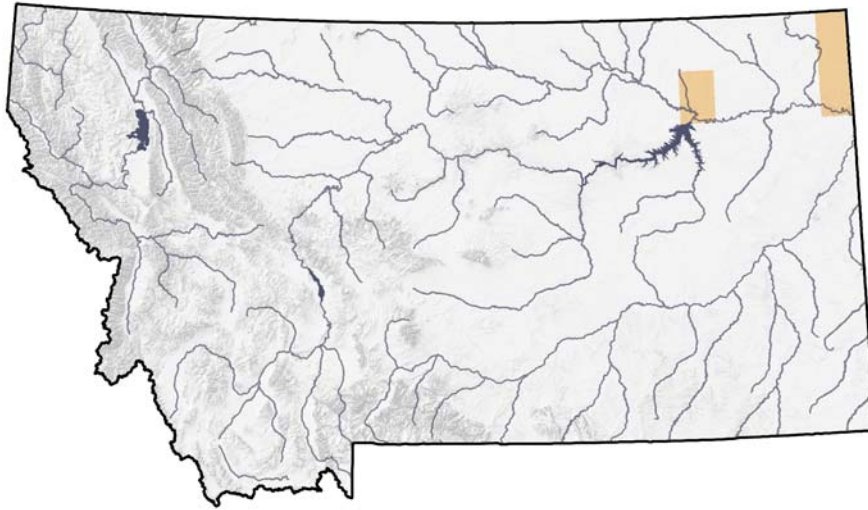


Figure 69. Distribution of the Sedge Wren

Range

The migratory pattern of this species in Montana is poorly known, and few records exist for the state. The earliest recorded date for Sedge Wren in Montana occurred in April 1909 in Gallatin County. Two recent records for Westby and Fort Peck indicate the presence of individuals in May (Montana Bird Distribution 2003).

Habitat

No specific information exists, but appropriate wetland habitat is present in the areas of the state in which the species has been recorded.

Management

No known active management is ongoing for Sedge Wren in the state. Sedge Wrens are a Species of Management Concern in USFWS Region 6 (U.S. Fish and Wildlife Service 1995).

Conservation Concerns

- Lack of information
- Human-directed disturbance to wetland habitats (i.e. disturbance can/does include impacts of cattle grazing, draining, vegetation manipulation, invasion of non-native plant and animal species, etc.)

Conservation Strategies

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- Determine breeding status and identify breeding locations
- Increased survey, inventory, and monitoring projects
- Conservation/apply appropriate management of wetland habitats of known use by Sedge wrens

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Management Plan

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Casey, D. 2000. Partners in Flight Bird Conservation Plan Montana Version 1.0. Montana Partners in Flight. Kalispell, Montana.

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Nelson's Sharp-tailed Sparrow (*Ammodramus nesloni*)

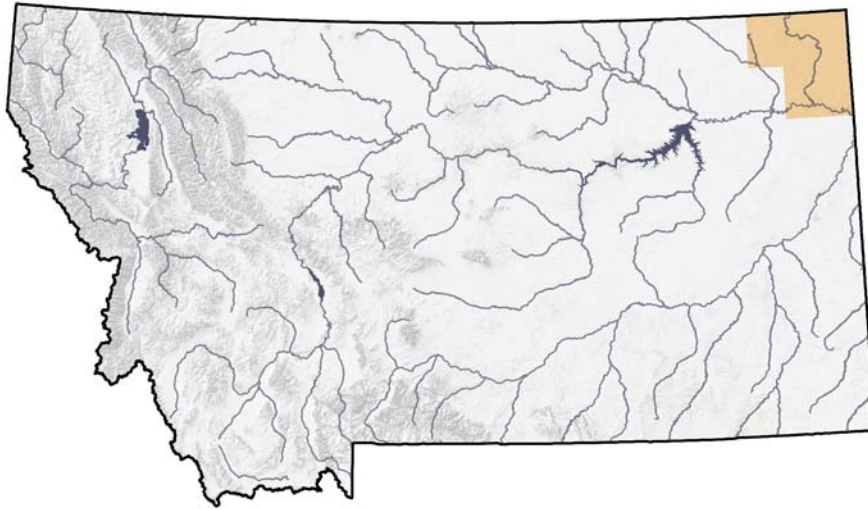


Figure 70. Distribution of the Nelson's Sharp-tailed Sparrow

Range

Nelson's Sharp-tailed Sparrow has an extremely limited range in Montana. The species has only been observed in eastern Sheridan and northeastern Roosevelt counties. About a dozen observations for this species have been made, and only a single breeding occurrence has been documented (Montana Bird Distribution 2003, MTNHP 2003).

Habitat

There is very little information about the habitat for this species in Montana, however it is assumed that the habitat is similar to that used in other portions of the species' range. This species prefers freshwater wetlands with dense, emergent vegetation or damp areas with dense grasses (Bownan 1904, Murray 1969, Stewart 1975, Krapu and Green 1978, Knapton 1979, Williams and Zimmer 1992, Berkey et al. 1993). In North Dakota, Nelson's Sharp-tailed Sparrows were common in prairie cordgrass (*Spartina pectinata*) stands, occurred at the edges of common reed (*Phragmites australis*) stands, and nested in sprangletop (Murray 1969). In northeastern North Dakota, they nested in thin, sparse grass on a wet alkali flat (Rolfe 1899, Hill 1968).

Nests usually are built in stands of grasses with litter that is persistent from year to year (Greenlaw 1993). Nests are built on or slightly above the ground in damp areas among emergent vegetation (Murray 1969, Stewart 1975). In North Dakota, Nelson's Sharp-tailed Sparrows are more abundant in dry years than in wet years (Stewart 1975). In dry years, they nest in the shallow-marsh and deep-

marsh zones of wetlands. In wet years, they nest in cordgrass (*Spartina* spp.) within wet-meadow zones.

Management

No known active management is ongoing for Nelson's Sharp-tailed Sparrows in the state. Conservation Reserve Program practices may provide large blocks of suitable habitat for this species in northeastern Montana.

Conservation Concerns

- Not adequately monitored or understood
- Due to small occupied area, risk of extirpation from state is high
- Wetland destruction
- Parasitism by Brown-headed Cowbird

Conservation Strategies

- Increased monitoring and survey efforts, especially breeding sites
- Protection of area where species is found
- Wetland restoration and protection
- Increased management of grazing regimes that promote healthy habitat

Management Plans

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Rich, T.D., C.J. Beardmore, H. Berlanga, P.J. Blancher, M. S. W. Bradstreet, G. S. Butcher, D.W. Demarest, E. H. Dunn, W. C. Hunter, E. E. Inigo-Elias, J. A. Kennedy, A. M. Martell, A. O. Panjabi, D. N. Pashley, K. V. Rosenberg, C. M. Rustay, J. S. Wendt, T. C. Will. 2004. Partners in Flight North American Landbird Conservation Plan. Cornell Lab of Ornithology. Ithaca, NY.

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Mammals

Spotted Bat (*Euderma maculatum*)

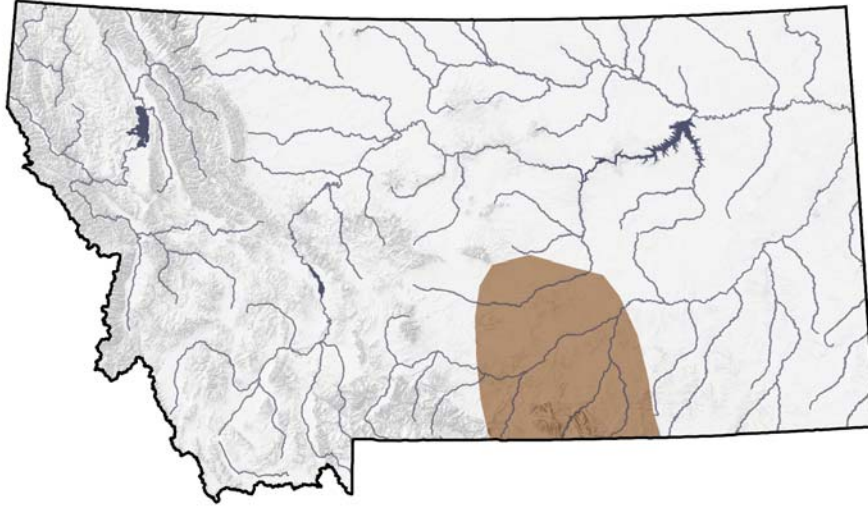


Figure 71. Distribution of the Spotted Bat

Range

The full extent of the range in Montana is unknown, due to limited survey effort and less than two-dozen reported encounters, and these mostly from Carbon County. Spotted bats appear to be restricted to areas east of the Continental Divide in south-central Montana. Voucher specimens exist for Carbon and Yellowstone counties, and there are reports from Big Horn and Powder River counties, all dating from 1949 to 1990 (Nicholson 1950, Fenton et al. 1987, Worthington 1991a, 1991b, Foresman 2001); there are recent observations from additional localities in Carbon County (Hendricks and Carlson 2001). Spotted bats in Montana have been encountered at elevations ranging from 3124 to 7800 feet (952-2377 meters).

Habitat

Spotted bats have been encountered or detected often in open arid habitats in close proximity to tall cliffs. Outside Montana these areas are sometimes dominated by Utah juniper (*Juniperus osteosperma*) and sagebrush (*Artemisia tridentata* and *A. nova*), sometimes intermixed with limber pine or Douglas-fir, or in grassy meadows in ponderosa pine savannah (Fenton et al. 1987, Worthington 1991b, Hendricks and Carlson 2001). In Montana, these areas are sometimes dominated by Rocky Mountain juniper (*Juniperus scopulorum*). Cliffs, rocky outcrops, and water are other attributes of sites where spotted bats have been found (Foresman 2001), typical for the global range. Spotted bat has been captured foraging over an isolated pond within a few kilometers of huge

limestone escarpments in the Big Horn Canyon National Recreation Area, Carbon County (Worthington 1991a, 1991b), and the first record for the state was of an individual that flew in an open window at a private residence in Billings, Yellowstone County (Nicholson 1950). They have been heard along the Missouri River at several locations in the Wild and Scenic section (DuBois 2005 per.com.). Spotted bats are now known to be fairly widespread, but quite sparse in population, adding to the difficulty of detection (DuBois 2005 per. com.). Factors that limit their distribution are not understood and roost habitats and sites have not been documented in Montana.

In other areas, spotted bats have been detected at water sources and in meadow openings, often with large cliffs nearby (Leonard and Fenton 1983, Storz 1995, Perry et al. 1997, Rabe et al. 1998, Gitzen et al. 2001).

Spotted bats roost in caves, and in cracks and crevices in cliffs and canyons, with which this species is consistently associated; it can crawl with ease on both horizontal and vertical surfaces (Snow 1974, Van Zyll de Jong 1985). In British Columbia, individuals used the same roost each night during May through July, but not after early August (Wai-Ping and Fenton 1989). Winter habitat is poorly documented. A possible explanation for the early paucity of collections in natural situations is the bat's narrow habitat tolerance (Handley 1959, Snow 1974).

Management

Spotted bats have persisted for over 50 years in the general area of the state where they were first discovered (Nicholson 1950, Hendricks and Carlson 2001). This is encouraging, given that essentially nothing is known of abundance, reproductive biology, habitat requirements, movements, and roost site selection in Montana, nor have the potential threats to this bat been identified. The lack of information on this species makes development and implementation of any effective management activity tenuous. Fortunately, the roosting habitat most favored by this bat (cliffs) provides it protection from many kinds of disturbance. Nevertheless, any roosts that are discovered should be protected and monitored. Studies to fill the gaps in our knowledge about this bat in Montana are needed, especially surveys throughout the state in appropriate habitats and landscapes to determine the full extent of its distribution. The audible calls make a survey much easier to conduct (Pierson and Rainey 1998), as no special skill is needed, other than familiarity with the calls and knowledge of the habitats likely to support spotted bats. The most immediate management action that can benefit this species (and other bat species as well) is protection of water sources in arid regions where this bat is present and water sources are limited. Open waste sumps, and similar hazardous standing water bodies associated with oil and gas fields, could present a significant hazard to spotted bats and other bat species as these energy resources are exploited.

Conservation Concerns

- Riparian degradation that could affect sustainable prey (moths) populations
- Open waste sumps and similar hazardous standing water bodies associated with oil and gas fields
- Lack of information due to difficulty of surveying
- Recreational climbing disturbs roost sites
- Use of pesticides that bats may accumulate through their diet and that kill their prey

Conservation Strategies

- Complete the Montana Bat Management Plan (in progress)
- Protection of water sources in arid regions
- Increase monitoring and surveys
- Support and cooperate in studies to determine more about the impacts of humans

Management Plans

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9862

Townsend's Big-eared Bat (*Corynorhinus townsendii*)



Figure 72. Distribution of the Townsend's Big-eared Bat

Range

The complete extent of the range of Townsend's big-eared bat in Montana is unknown, due to the limited survey effort across many areas. It has been documented in over 20 counties (voucher specimens from 14) and on both sides of the Continental Divide, from the Idaho state line in the west to the North Dakota and South Dakota state lines in the east, and from the Wyoming state line in the south to the Canadian border with Alberta in the northwest (Hoffmann et al. 1969, Swenson and Shanks 1979, Hendricks et al. 1996, Hendricks and Kampwerth 2001, Foresman 2001), at elevations of 1968 to 7820 feet (600 to 2384 meters). The only known location north of the Missouri River in northeastern Montana is in the Little Rocky Mountains (Hendricks et al. 2000); this species has not yet been reported in Alberta or Saskatchewan.

Habitat

Habitat use in Montana has not been evaluated in detail, but seems to be similar to other localities in the western United States. Caves and abandoned mines are used for maternity roosts and hibernacula (Worthington 1991, Hendricks et al. 1996, Hendricks 2000, Hendricks et al. 2000, Foresman 2001, Hendricks and Kampwerth 2001); use of buildings in late summer has also been reported (Swenson and Shanks 1979). Habitats in the vicinity of roosts include Douglas-fir and lodgepole pine forests, ponderosa pine woodlands, Utah juniper-sagebrush scrub, and cottonwood bottomland. In hibernacula, ambient temperatures ranged from -1.0 to 8.0 degrees (30 to 46 when torpid Townsend's big-eared bats were present) (Hendricks and Kampwerth 2001). Temperatures at maternity roosts are poorly documented; the temperature was 12 degrees (54 in mid-July near a

colony in an abandoned mine in Lake County), and 18 degrees (66 in August near a colony in a large and relatively open cave chamber in Lewis and Clark County). Most caves and mines in Montana appear to be too cool in summer for use as maternity roosts. Townsend's big-eared bat feed on many different flying insects and may be a moth specialist.

Management

The response by Townsend's big-eared bats to human activities is largely undocumented in Montana. The maternity colony at Lewis and Clark Caverns has persisted for over a century, but has decreased in recent years, with no bats returning in 2005. In eastern Montana, numerous abandoned coal mines have been completely closed in recent decades, several of which were used as hibernacula; these mines are no longer accessible to bats. Abandoned mine reclamation has also been underway in western Montana during the same time. During the last decade, mine surveys prior to closure have been undertaken by land management agencies to determine the potential of abandoned mines as bat habitat. In some cases bat-friendly gates were installed at known Townsend's big-eared bat roosts, and the roosts have continued to be used after gate installation (Hendricks 1999, Hendricks and Kampwerth 2001). Some caves in the Pryor Mountains and Little Rocky Mountains with documented use by Townsend's big-eared bat are protected with bat-friendly gates (Worthington 1991, Hendricks et al. 2000). Abandoned mines should be surveyed for Townsend's big-eared bats or other bat species prior to any reclamation activity. Surveys should follow protocols in the conservation assessment and conservation strategy (Pierson et al. 1999). Installation of bat-friendly gates should be considered as a protective measure for all Townsend's big-eared bat roosts. Other land management activity (cave management, pesticide spraying, timber harvest, other vegetation conversion) at or near known roosts should also be conducted according to the best management practices outlined in the conservation assessment and strategy. Maternity roosts and hibernacula should be routinely monitored to establish population trends across the state. Undiscovered maternity colonies and hibernacula undoubtedly exist in Montana. All observations of Townsend's big-eared bat roosts should be reported to the appropriate land management agency, the Montana Natural Heritage Program, or the Montana Department of Fish, Wildlife & Parks.

Conservation Concerns

- Vandalism to maternity colonies and hibernacula
- Abandoned mine closures
- Toxic material impoundments
- Degradation and loss of native riparian vegetation

Conservation Strategies

- Complete the Montana Bat Management Plan (in progress)
- Identification of maternity colonies and hibernacula and closures to recreationalists to these areas
- Install bat-friendly gates to coal mines instead of closure
- Ensure non-toxic materials utilized and non-toxic byproducts during mining activities
- Reduce levels of human activities around known bat roosts through road management, signs, and public education
- Maintain and improve the condition of riparian vegetation for bat foraging areas
- Recruit and educate recreational caving groups to assist with management of caves

Management Plans

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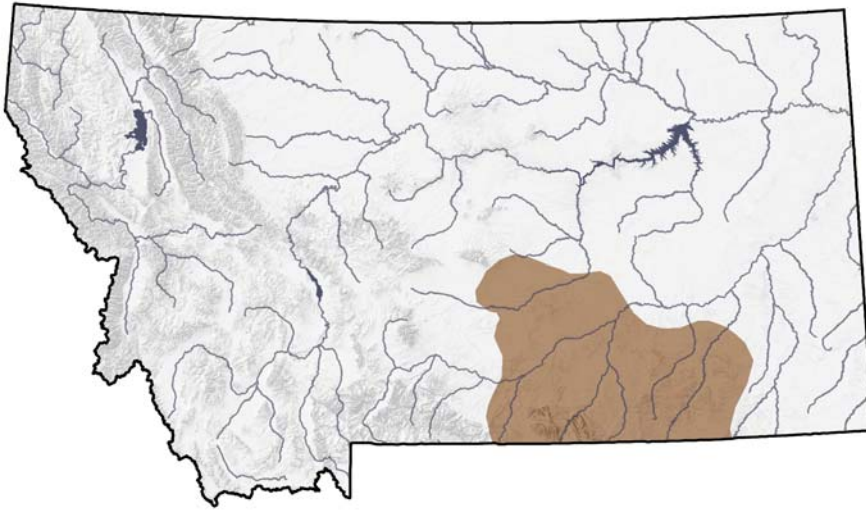
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10038

10039

10039 **Pallid Bat (*Antrozous pallidus*)**
 10040



10041
 10042 Figure 73. Distribution of the Pallid Bat
 10043

10044 **Range**
 10045

10046 The known distribution of the pallid bat in Montana is not yet well defined, but
 10047 Montana is at the northeastern edge of the global range. Several have been
 10048 captured east of the Continental Divide in south-central Montana, at Layout
 10049 Creek and Gyp Spring in southern Carbon County (Shryer and Flath 1980,
 10050 Worthington 1991, P Hendricks and J. Carlson personal observation), and west
 10051 of Colestrip, Rosebud County. Montana records are from 1158 to 1402 meters
 10052 (3800 to 4600 feet) elevation.
 10053

10054 **Habitat**
 10055

10056 Habitat at the Carbon County sites is Utah juniper-black sagebrush (*Juniperus*
 10057 *osteosperma*-*Artemisia nova*). The Rosebud County site is in an area of
 10058 ponderosa pine (*Pinus ponderosa*) savannah and big sagebrush (*Artemisia*
 10059 *tridentata*). Both areas have rock outcrops (limestone or sandstone) in the
 10060 immediate vicinity or within short flying distance. This species has not yet been
 10061 detected at rock crevices, caves or abandoned mines in Montana; most
 10062 observations have been at water sources (spring-fed streams or ponds; e.g.
 10063 Carbon County) (Shryer 1980). However, habitat use in Montana by this species
 10064 remains poorly known and unstudied.
 10065

10066 At other locations, pallid bats have been found in arid deserts, juniper woodlands,
 10067 sagebrush shrub-steppe, and grasslands, often with rocky outcrops and water
 10068 nearby. They are less abundant in evergreen and mixed conifer woodlands, but
 10069 in British Columbia are found in ponderosa pine forest near cliffs (Nagorsen and
 10070 Brigham 1993). They typically roost in rock crevice or buildings, less often in

caves, tree hollows, under bridges, and in abandoned mines (Hermanson and O'Shea 1983, Verts and Carraway 1998); night roosts often are in caves in Oklahoma (Caire et al. 1989). Four summer roosts in Wyoming were in rock shelters (1), caves (2), and mines (1) (Priday and Luce 1997). Day and night roosts are usually distinct. In Oregon, night roosts were in buildings, under rock overhangs, and under bridges; bats generally were faithful to particular night roosts both within and between years (Lewis 1994). Night roosts in British Columbia were often in cavities in ponderosa pine (Nagorsen and Brigham 1993). Day roosts include rock piles, tree hollows, and rock crevices. Pallid bats found in caves or mines usually use crevices within these places (Hermanson and O'Shea 1983, Caire et al. 1989). Maternity colonies are often located in horizontal crevices in rock outcrops and man-made structures, where temperatures are a fairly constant 30 degrees. Pallid bats forage on or near the ground and consume invertebrates such as scorpions, centipedes, crickets, grasshoppers and beetles.

Management

Pallid bats have persisted for over 20 years in the general area of the state where they were first discovered (Shryer and Flath 1980, Worthington 1991, P. Hendricks and J. Carlson personal observation). This is encouraging, given that essentially nothing is known of abundance, reproductive biology, habitat requirements, movements, and roost site selection in Montana, nor have the potential threats to this bat been identified. The lack of information on this species makes development and implementation of any effective management activity tenuous at best. Fortunately, the roosting habitat often favored by this bat (crevices in cliffs and rock outcrops) provides it protection from many kinds of disturbance. Nevertheless, any roosts that are discovered should be protected and monitored, as pallid bats also use abandoned buildings and bridges as roosts. Studies to fill the gaps in our knowledge of this bat in Montana are needed, especially surveys throughout the state in appropriate habitats and landscapes to determine the full extent of its distribution. The most immediate management action that can benefit this species (and other bat species as well) is protection of water sources in arid regions where this bat is present and water sources are limited. Open waste sumps, and similar hazardous standing water bodies associated with oil and gas fields, could present a significant hazard to pallid bats and other bat species as these energy resources are exploited.

Conservation Concerns

- Little information of distribution, population and requirements
- Oil and gas fields disturbance of water sources
- Roost disturbance
- Recreational caving
- Closure of mines for reclamation
- Overuse of pesticide spraying of rangelands

Conservation Strategies

- Complete the Montana Bat Management Plan (in progress)
- Protection of water sources in arid regions
- Protection of roost sites
- Increased survey and monitoring techniques
- Educate recreationalists on the threats to bats

Management Plans

Altenbach, J. S., W. Amy, P. V. Bradley, P. E. Brown, K. Dewberry, D. B. Hall, J. Jeffers, B. Lund, J. E. Newmark, M. J. O'Farrell, M. Rahn, R. E. Sherwin, C. R. Tomlinson, J. A. Williams. 2002. Nevada Bat Conservation Plan. Nevada Bat Working Group. Austin, Nevada. 188 pp.

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Pygmy Rabbit (*Brachylagus idahoensis*)

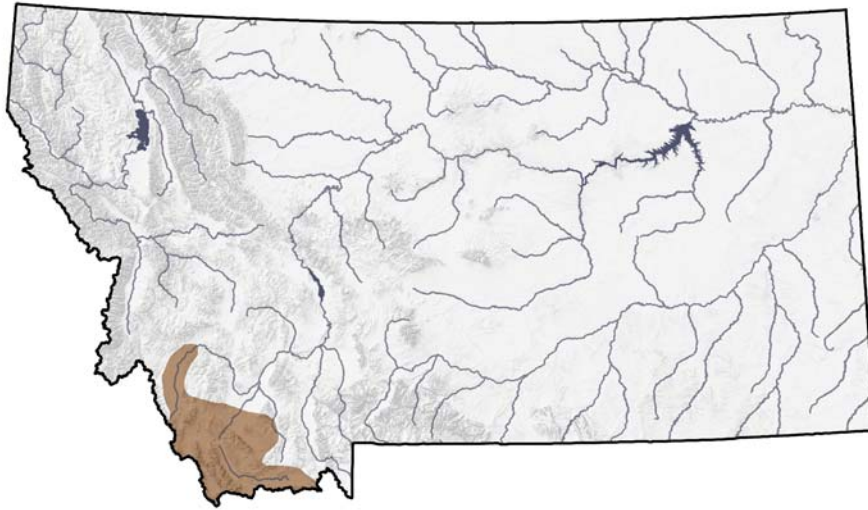


Figure 74. Distribution of the Pygmy Rabbit

Range

Montana lies on the northeastern edge of pygmy rabbit distribution. There are confirmed records dating back to 1918 from three southwestern counties (Beaverhead, Jefferson, Madison), with most of the Montana range in Beaverhead County (Davis 1937, Hoffmann et al. 1969, Rauscher 1997, Foresman 2001a); a 1937 specimen reported from near Lake Como in Ravalli County needs verification. Rauscher (1977) documented occupation in the southern portion of SilverBow County. Records are from elevations between 4500 to 6700 feet (1372 to 2042 meters).

Habitat

Occupied habitats in Montana include shrub-grasslands on alluvial fans, floodplains, plateaus, high mountain valleys, and mountain slopes, where suitable sagebrush cover and soils for burrowing are available. Some occupied sites may support a relatively sparse cover of sagebrush and shallow soils, but these usually support patches of dense sagebrush and deeper soils. Big sagebrush was the dominant shrub at all occupied sites, averaging 21.3 to 22.6% coverage; bare ground averaged 33% and forbs 5.8%. Average height of sagebrush in occupied sites was 0.4 meter (Rauscher 1997). In southwestern Wyoming, pygmy rabbits selectively used dense and structurally diverse stands of sagebrush that accumulated a relatively large amount of snow; the subnivean environment provided access to a relatively constant supply of food and protection from predators and thermal extremes (Katzner and Parker 1997).

Pygmy rabbits dig burrows extending to a depth of 1 meter and they form

chambers as part of the burrow system. Burrows have been excavated but no nests have been found and the location of nests is not known (Green and Flinders 1980a).

Management

No special management activities have been developed or implemented in Montana specifically for pygmy rabbits. However, conservation habitat management to preserve sagebrush habitat for other species, e.g. sage grouse, will likely benefit pygmy rabbits. The loss of habitat from conversion to cropland and pasture is probably not great in southwestern Montana. Burning and other methods of sagebrush removal, however, have been used in past and recent years to improve rangeland for livestock. Removal of sagebrush will make the landscape unsuitable for pygmy rabbits. This species is found where grazing occurs, so long as sagebrush cover is maintained, but overgrazing could result in loss of forbs and grasses that are summer foods to pygmy rabbits, and livestock could damage sagebrush structure by trampling plants and thinning the shrub canopy. Dense stands of sagebrush along streams, fence lines, and borrow ditches are probably essential avenues for dispersal of pygmy rabbits. If sagebrush is removed, it may isolate or eliminate pygmy rabbits in some areas, unless it is done in such a way as to maintain a mosaic of patches of relatively large size isolated only by narrow expanses of unsuitable habitat. All areas within the range of the pygmy rabbit in Montana where sagebrush removal is planned should first be evaluated for impact to this species (Rauscher 1997).

Conservation Concerns

- Sagebrush destruction from clearing and livestock
- Fragmentation of available habitat
- Habitat specialist on all scales

Conservation Strategies

- Consider preparing management plan for pygmy rabbit or inclusion into other comprehensive taxonomic plan
- Sagebrush protection on a large scale
- Livestock rotation on lands
- Continue surveying for new populations and monitoring of existing ones
- Coordination efforts with federal agencies including BLM and USFS

Management Plan

None

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Hoary Marmot (*Marmota caligata*)

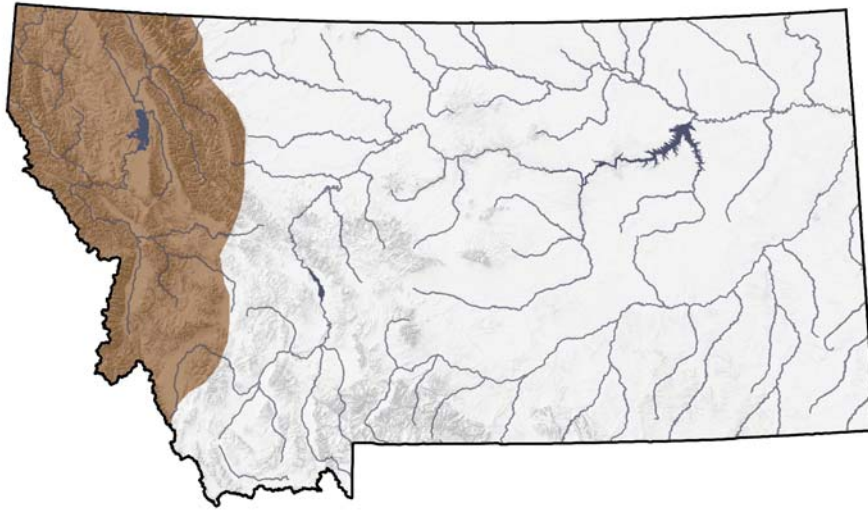


Figure 75. Distribution of the Hoary Marmot

Range

Although the distribution map provided above indicates that Hoary Marmots occur throughout western Montana, they most likely only occupy 5 to 10% of the area depicted. They do not occur in the Salish Mountains and only in small pockets in the Whitfish range. They are generally confined to high subalpine and alpine habitats. May move through coniferous forest in NW MT. Small, scattered, isolated populations South of Mission Mountains (Foresman 2001). Emphasis should be placed on future field inventory to identify their range in Montana.

Habitat

Found primarily in rocky outcroppings and large boulder fields high subalpine and alpine regions of Montana where they feed, burrow and raise young.

Management

Management of species includes collecting information on where Hoary marmots are distributed, population numbers, and about habits. In addition, conserve small populations found on the periphery of their distribution, including scattered populations in high mountains of the Mission and Swan Mountains.

Conservation Concerns

- Lack of data on status and size of Montana populations, mountain range by mountain range
- Little or no connectivity between populations in distinct mountain ranges

- 10309 • Change in climate due to global warming

10310

10311 **Conservation Strategies**

10312

- 10313 • Determine the effects of inbreeding in isolated populations and examine
10314 feasibility of transplanting individuals between populations in an effort to
10315 increase genetic diversity

- 10316 • Prepare conservation plan, addressing conservation concerns and
10317 establishing a monitoring protocol

- 10318 • Conduct inventory to obtain estimates of population status and size, and
10319 distribution

10320

10321 **Management Plan**

10322

10323 None

10324

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Black-tailed Prairie Dog (*Cynomys ludovicianus*)

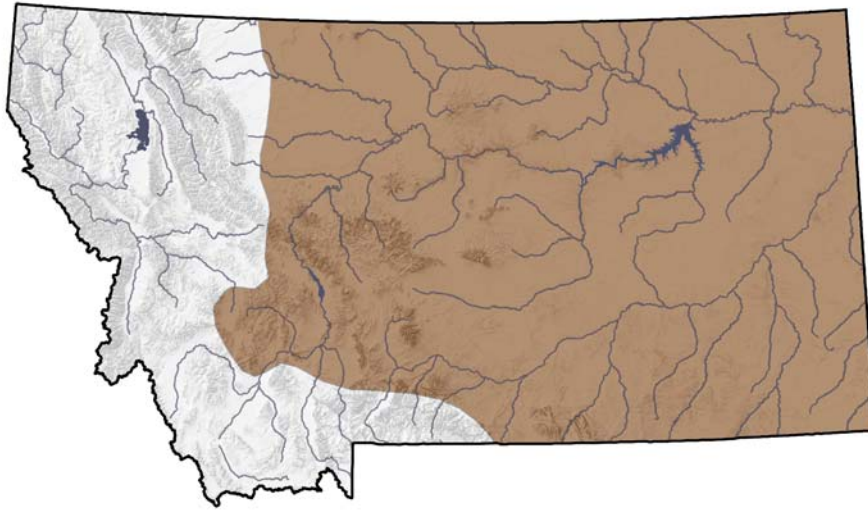


Figure 76. Distribution of the Black-tailed Prairie Dog

Range

Black-tailed prairie dogs are found across eastern Montana except in the northeastern corner and the Clarks Fork of the Yellowstone drainage (Campbell 1989).

Habitat

Prairie dog colonies are found on flat, open grasslands and shrub/grasslands with low, relatively sparse vegetation. The most frequently occupied habitat in Montana is dominated by western wheatgrass, blue grama and big sagebrush (Montana Fish, Wildlife & Parks 2002). Colonies are associated with silty clay loams, sandy clay loams, and loams (Thorp 1949, Bonham and Lerwick 1976, Klatt and Hein 1978, Agnew et al. 1986) and fine to medium textured soils are preferred (Merriam 1902, Thorp 1949, Koford 1958), presumably because burrows and other structures tend to retain their shape and strength better than in coarse, loose soils. Encroachment into sandy soil (e.g., loamy fine sand) does occur if the habitat is needed for colony expansion (Osborn 1942).

Shallow slopes of less than 10% are preferred (Koford 1958, Hillman et al. 1979, Dalsted et al. 1981), presumably in part because such areas drain well and are only slightly prone to flooding. By colonizing areas with low vegetative stature, prairie dogs often select areas with past human (as well as animal) disturbance, including areas heavily used by cattle, such as water tanks and long-term supplemental feeding sites (Licht and Sanchez 1993, FaunaWest 1998).

Management

In Montana, the black-tailed prairie dog has been designated a nongame wildlife species in need of management. Shooting of prairie dogs on public lands (excluding state school trust lands) has been regulated. Consult Montana Fish, Wildlife & Parks for the latest regulations. Prairie dogs are managed under the Conservation Plan for Black-tailed and White-tailed Prairie Dogs in Montana (Montana Prairie Dog Working Group 2002). Please consult this plan for details concerning prairie dog management in Montana.

Conservation Concerns

- Conversion of native rangelands to agriculture and to a lesser degree, residential development
- Conflicts between the present abundance of prairie dogs, and other land uses
- Disease, particularly sylvatic plague (*Yersinia pestis*)

Conservation Strategies

- Develop regional prairie dog distribution and abundance goals
- Continue prairie dog inventory and monitoring efforts
- Institute a landowner incentive program and a prairie dog control program designed to contain prairie dog acreage, rather than eradicate prairie dogs
- Identify isolated prairie dog colonies and apply management measures necessary to maintain current distribution
- Develop and implement a prairie dog ecosystem education program
- Identify and support or conduct research projects designed to form solutions to short-term and long-term biological and social problems related to black-tailed prairie dog communities and their management

Management Plan

Conservation Plan for Black-tailed and White-tailed Prairie Dogs in Montana (Montana Prairie Dog Working Group 2002).

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White-tailed prairie Dog (*Cynomys leucurus*)

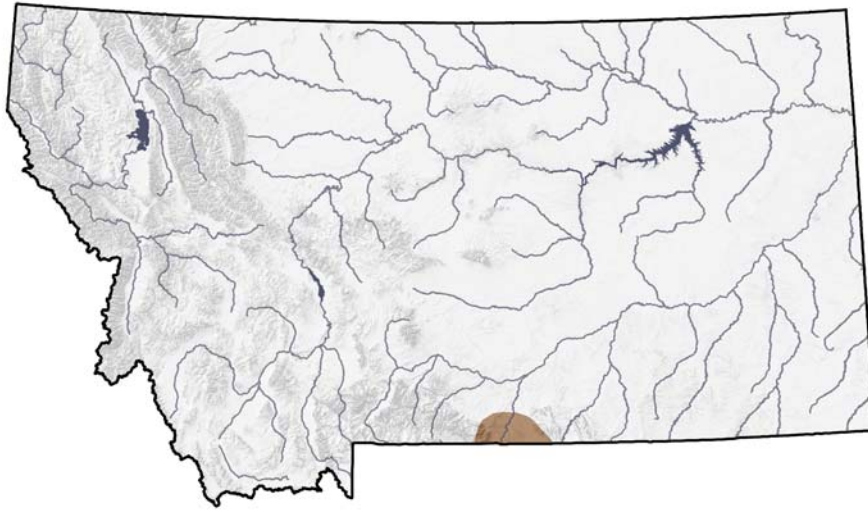


Figure 77. Distribution of the White-tailed Prairie Dog

Range

In Montana, white-tailed prairie dogs now only inhabit a small area in the Southcentral portion of state, near the Pryor Mountains.

Habitat

Throughout their range, white-tailed prairie dogs inhabit xeric sites with mixed stands of shrubs and grasses. In Montana they inhabit sites dominated by Nuttall saltbrush with lesser amounts of big sage, and areas with poverty sumpweed (Flath 1979). They live at higher elevations and in meadows with more diverse grass and herb cover than do black-tailed prairie dogs (Hoffmann, in Wilson and Ruff 1999) and their range in Montana is at higher elevations than other sites within their distribution.

Management

White-tailed prairie dogs are designated as nongame wildlife species in need of management in Montana. Public lands (excluding state school trust lands) in the portion of Carbon County occupied by white-tailed prairie dogs has been closed to sport shooting on a year round basis. Please consult Montana Fish, Wildlife & Parks for the most current regulations concerning prairie dogs. White-tailed prairie dogs are managed under the Conservation Plan for Black-tailed and White-tailed Prairie Dogs in Montana (Montana Prairie Dog Working Group 2002). Please consult this plan for details concerning prairie dog management in Montana.

10480 **Conservation Concerns**

- 10481
- 10482 • Conversion of native rangelands to agriculture and, to a lesser degree,
10483 residential development
 - 10484 • Disease, particularly sylvatic plague (*Yersinia pestis*)
 - 10485 • Vulnerability of remaining small and isolated colonies to extirpation, which
10486 could result in contraction in the current range of this species
- 10487

10488 **Conservation Strategies**

- 10489
- 10490 • Reintroduce white-tailed prairie dogs to sites that were formerly occupied
10491 until the early 1990s
 - 10492 • Translocate white-tailed prairie dogs from a colony in the path of a
10493 highway upgrade project, to a formerly occupied site on BLM land
- 10494

10495 **Management Plan**

10496

10497 Conservation Plan for Black-tailed and White-tailed Prairie Dogs in Montana;
10498 Montana Prairie Dog Working Group 2002.

10499

10500 **Citations**

10501

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Great Basin Pocket Mouse (*Perognathus parvus*)

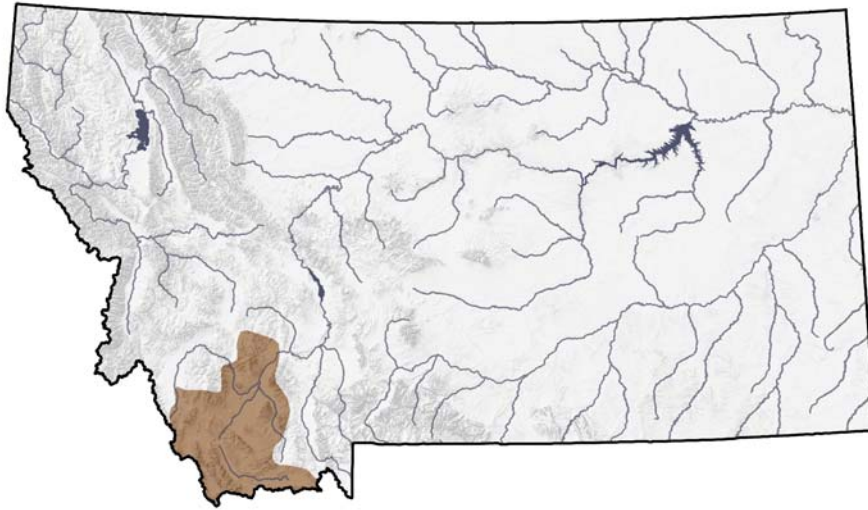


Figure 78. Distribution of the Great Basin Pocket Mouse

Range

The Great Basin pocket mouse is restricted in Montana to the extreme southwestern portion of the state, east of the Continental Divide. All records are from Beaverhead County except one from Jefferson County (Hoffmann et al. 1969, Foresman 2001a, Hendricks and Roedel 2002). They are suspected to occur in Madison County. Individuals have been captured at elevations up to 2030 meters (6660 feet). The Great Basin pocket mouse is found throughout the Great Basin and adjacent regions of the West, from south-central British Columbia southward through eastern Washington and Oregon to southern California, Nevada, northern Arizona, western Utah, southern Idaho, southwestern Montana, and southwestern Wyoming (Verts and Kirkland 1988). It usually occurs below elevations of 2500 meters (8200 feet).

Habitat

Occupied habitats in Montana are arid and sometimes sparsely vegetated. They include grassland-shrubland with less than 40% cover, stabilized sandhills, and landscapes with sandy soils, more than 28% sagebrush cover, and 0.3 to 2.0 meters shrub height (Hoffmann et al. 1969, Frissell 1978, Hendricks and Roedel 2001, 2002, P. Hendricks unpublished data).

Data from other portions of its range suggest a variety of western arid and semiarid habitats are occupied, including pine woodland, juniper-sagebrush scablands, sandy short-grass steppes, and shrubland covered with sagebrush, bitterbrush, greasewood, and rabbitbrush; heavily forested habitats are avoided. They are captured more often than expected (based on availability) at sites with

more than 40% ground cover. On plots where fire killed the shrub cover, the species is one-third as abundant as on adjacent unburned plots. They usually are found in habitats with light-textured, deep soils, and sometimes in shrublands among rocks. Presence is positively correlated with percent sand and negatively with percent clay. Adults sleep and rear young in underground burrows (Verts and Kirkland 1988, Verts and Carraway 1998).

Management

No special management activities are currently recognized in order to maintain viable populations of this species in Montana. Land management designed to maintain a mosaic of sagebrush cover, size, and age classes would benefit this species, especially if it promotes the growth of grasses and forbs within sagebrush stands; large-scale sagebrush removal should be avoided. Livestock probably competes with pocket mice for grasses and reduce shrub and grass cover (Hendricks and Roedel 2001).

Conservation Concerns

- Habitat loss, large scale removal of sagebrush
- Competition for grasses, livestock probably compete with pocket mice for grasses and reduce shrub and grass cover

Conservation Strategies

- Consider preparing management plan for Great Basin Pocket Mouse or inclusion into other comprehensive taxonomic plan
- Land management designed to maintain a mosaic of sagebrush cover, size, and age classes will benefit this species, especially if it promotes the growth of grasses and forbs within sagebrush stands
- Rotation of livestock areas
- Evaluate the quality and quantity of occupied and potentially suitable areas

Management Plan

None

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Northern Bog Lemming (*Synaptomys borealis*)

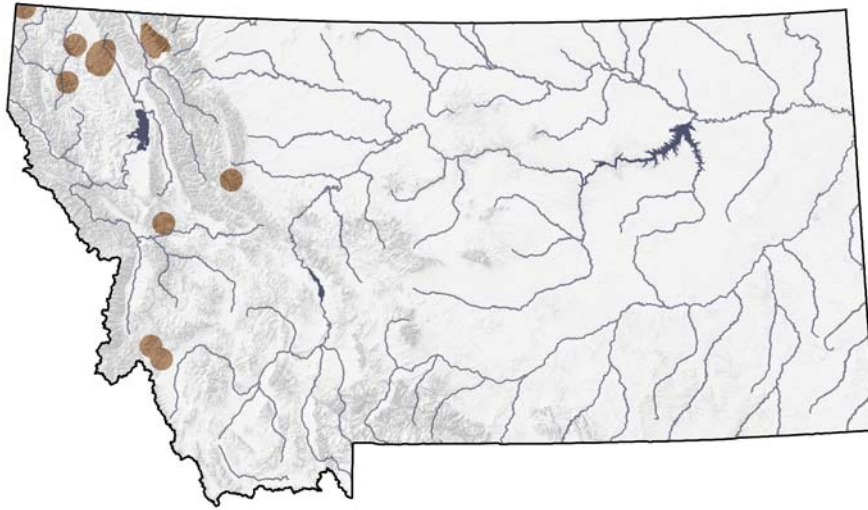


Figure 79. Distribution of the Northern Bog Lemming

Range

The Northern bog lemming has a widespread distribution extending from Alaska easterly to Labrador and south to portions of the northern U.S. In Montana, the northern bog lemming is at the southern margin of global distribution in the Rocky Mountains, and has been documented at 18 isolated sites. Records are available for six counties (Beaverhead, Flathead, Lewis and Clark, Lincoln, Missoula, Ravalli), with all but two sites (one in Beaverhead County - Lost Trail Pass, one in Lewis and Clark County) occurring west of the Continental Divide (Reichel and Corn 1997, Foresman 2001a). Elevation of these sites ranges from 3340 to 6520 feet (1018 to 1987 meters), but a 2003 record from a new site in Ravalli County extends the upper elevation limit to 7400 feet (2256 meters) (B. Maxell personal communication).

Habitat

Northern bog lemmings occupy a variety of habitats throughout their range, especially near the southern edge of the global distribution. Typically, these habitats have high moisture levels and include sphagnum bogs, wet meadows, moist mixed and coniferous forests, montane sedge meadows, krummholz spruce-fir forest with dense herbaceous and mossy understory, alpine tundra, mossy streamsides, and even sagebrush slopes in the case of *S. b. artemisiae* in British Columbia (Clough and Albright 1987, West 1999, Streubel 2000). Within these habitats, they occupy surface runways and burrow systems up to 12 inches deep and can be found in small colonies with population densities that may reach 36 individuals per acre. (Streubel 2000). They are active day and night throughout the year, feeding on grasses and other herbaceous vegetation.

Young are born in nests that may be underground or on the surface in concealing vegetation. Northern Bog Lemmings in Montana have been found in at least nine community types, including Engelmann spruce, subalpine fir, birch, willow, sedge (*Carex*), spike rush (*Eleocharis*), or combinations of the above, often occurring in wet meadows, fens, or bog-like environments. Wright (1950) captured lemmings in a swampy area containing spruce trees, timothy, alder and other moist-site plants (Wright 1950). The Upper Rattlesnake Creek specimen was captured in a wet-sedge/bluejoint meadow near subalpine fir (Adelman 1979). Areas with extensive moss mats, primarily sphagnum, are the most likely sites to find new populations (Wright 1950, Reichel and Beckstrom 1994, Reichel and Corn 1997, Pearson 1999, Foresman 2001a).

Management

No coordinated management activities have been developed or implemented for this species in Montana. Nevertheless, some populations on U.S. Forest Service lands are providing added protection through special management/conservation policy guidelines applied to peatlands, including the Research Natural Area (RNA) designation (Chadde et al. 1998). RNA designation typically prohibits manipulative management, such as timber harvest and livestock grazing. The Clean Water Act and state water quality standards protect water quality of these peatlands. Protection guidelines (Reichel and Corn 1997) should be applied to all sites where Northern bog lemmings are known to occur, as well as potential peatland sites not yet surveyed for them. Guidelines include 1) assumption that Northern bog lemmings are present at sphagnum or bog/fen habitat patches unless site-specific surveys indicate otherwise, 2) restriction of timber harvest to a zone beyond a 100 meter buffer surrounding sphagnum or other bog/fens, or associated riparian areas that could provide corridors for dispersal to adjacent patches of suitable habitat, 3) minimizing livestock grazing in drainages with unsurveyed mossy areas present, and maintaining range conditions there and in those with populations present at good to excellent, and 4) elimination of management activities that could destroy bogs/fens (road-building, pothole blasting, trail construction, dam construction, alteration of surface and subsurface water flow, recreational vehicle use in fen habitats). Additional surveys should be undertaken to better understand the distribution in Montana, and known sites should be monitored routinely to determine population persistence and trends.

Conservation Concerns

- Bogs/fens are threatened by unsustainable domestic stock grazing, invasion of heavily grazed fens by exotic plants, and potential changes in the water regimes feeding the bogs/fens.
- Timber harvest around bog/fen habitats
- Poorly understood distribution in Montana

- Human disturbances (timber harvesting and roads) are directly related to the decreased diversity of vascular plants, a common food sources for Northern Bog Lemmings, in bogs/fens

Conservation Strategies

- Consider preparing management plan for Northern Bog Lemming or inclusion into other comprehensive taxonomic plans
- Restriction of timber harvest to a zone beyond a 100 meter buffer surrounding sphagnum or other fen moss mats, or associated riparian areas which could provide corridors for dispersal to adjacent patches of suitable habitat
- Additional surveys should be undertaken to better understand both the potential distribution in Montana and known sites of occupancy
- Known sites should be monitored routinely to determine population persistence and trends
- Minimizing livestock grazing in drainages with unsurveyed moss mats
- Elimination of management activities that could destroy bogs (road-building, pothole blasting, trail construction, dam construction, alteration of surface and subsurface water flow, recreational vehicle use in fen habitats).

Management Plan

None

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Meadow Jumping Mouse (*Zapus hudsonius*)



Figure 80. Distribution of the Meadow Jumping Mouse

Range

Montana is on the western edge of the global distribution in the Northern Great Plains. Meadow jumping mouse has been documented in six eastern and southeastern counties (Bighorn, Carter, Dawson, Powder River, Richland, Wibaux), at elevations to 4200 feet (1272 meters) (Foresman 2001a, Montana Natural Heritage Program database).

Habitat

In Montana, meadow jumping mice have been found in dense, tall and lush grass and forbs in marshy areas (sometimes with standing water), riparian areas, woody draws, and grassy upland slopes, sometimes within or near forested sites of ponderosa pine (Lampe et al. 1974, Matthews 1980, Matthews and Swenson 1982).

The meadow jumping mouse is generally described as a species which occupies moist lowland habitats rather than drier uplands, preferring relatively dense vegetation in open grassy and brushy areas of marshes, meadows, swamps, open conifer forest, and often favor sites bordered by small streams. On the Northern Great Plains this usually results in its restriction primarily to riparian habitats. When inactive, they occupy underground burrows, usually in banks or hills (winter), or under logs or grass clumps. Young are born in an underground nest or under other cover (Kruttsch 1954, Whitaker 1972, Jones et al. 1983).

Management

No special management activities have been developed or implemented for this species in Montana. Alteration of natural surface water sources for livestock, especially free-flowing springs and seeps, could have negative impacts on populations, given the preference of meadow jumping mice for grassland sites whose structure is influenced by the nearby presence of water (Lampe et al. 1974, Matthews 1980, Matthews and Swenson 1982). A thorough small mammal survey of appropriate mesic grassland, shrub-grassland, and meadow habitats in eastern and southeastern Montana is desirable to define the distribution and relative abundance of this species in the state.

Conservation Concerns

- Destruction of natural springs/seeps by and for livestock, and wetland conversion
- Lack of knowledge regarding immediate and long-term impacts of grazing
- Lack of data on status, distribution, habitat use, and abundance in Montana

Conservation Strategies

- Prepare conservation plan, addressing species-specific concerns and actions, or those pertaining to a suite of species with similar habitat use and needs
- Immediate protection of all springs and seeps within the potential range
- Standardized surveys to obtain estimates of population status, distribution, and habitat use, and to monitor known populations

Management Plan

None

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Foresman, K. R. 2001. The wild mammals of Montana. American Society of Mammalogists, Special Publication No. 12. 278 pp.

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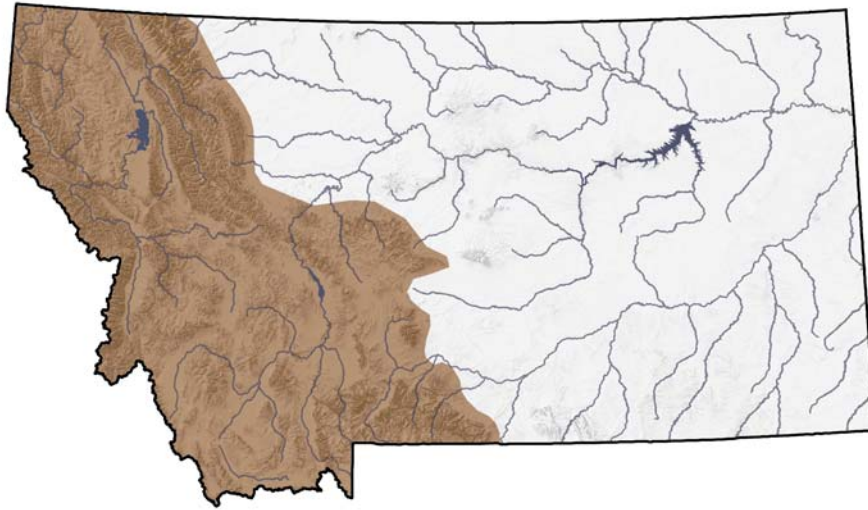
Gray Wolf (*Canis lupus*)

Figure 81. Distribution of the Gray Wolf

Range

There are three primary subpopulations in the Northern Rocky region. Natural dispersers have recolonated Northwest Montana. In 1995 and 1996, wolves were reintroduced in both Central Idaho and Yellowstone National Park. Wolves are expanding their range in Montana today. Yellowstone and Idaho wolves are expanding their range into new regions of Montana including the Bitterroot, Gravellys and Absaroka-Beartooths.

Habitat

The gray wolf exhibits no particular habitat preference. Wolves establishing new packs in Montana have demonstrated greater tolerance of human presence and disturbance than previously thought characteristic of this species (Thiel 1985, Mech et al. 1988, Mech 1989). They have established territories where prey is more abundant at lower elevations than expected, especially in winter (Montana Fish, Wildlife & Parks 2003).

Management

Although wolves dispersing from Canada were occasionally observed, gray wolves were essentially extirpated from Montana and the rest of the western United States in the early 1900s primarily due to conflicts with people. Wolves started recolonizing the area around Glacier National Park in 1979 and the first den documented in Montana in over 50 years was found in Glacier National Park in 1986. Wolves have since colonized much of northwestern Montana as a result of dispersal from Canada and Glacier National Park. In 1995 and 1996 wolves

were reintroduced into Yellowstone National Park and central Idaho. Wolves resulting from these reintroductions have since expanded into areas in Montana near these reintroduction sites and continue to expand in numbers and distribution in Montana.

Gray wolves in Montana are classified under the Endangered Species Act as “threatened” in the northwest Montana recovery area and as “experimental non-essential” across the southern part of Montana. Gray wolves reached biological recovery goals for the Northern Rocky Mountains at the end of 2002. However, the process of delisting the species is currently on hold due to the lack of approved management plans from all three states. Early in 2004, the U.S. Fish and Wildlife Service approved the Montana Gray Wolf Conservation and Management Plan (Montana Fish, Wildlife & Parks 2003). Since then, Montana Fish, Wildlife & Parks has been increasing its role and the agency is now implementing the state’s wolf conservation and management plan. Montana Fish, Wildlife & Parks assumed that management responsibility through cooperative agreements between the two agencies. The agreements transfer legal authority to Montana Fish, Wildlife & Parks to begin implementing as much of the state plan as allowed under federal regulations, even though wolves currently remain listed.

Conservation Concerns

- Chronic livestock-wolf interactions often result in lethal control to resolve conflicts
- Illegal human mortality
- Variable public tolerance throughout Montana landscape of ownership

Conservation Strategies

- Public outreach to increase awareness of wolf biology, conservation and management
- Monitoring to document primarytenance of a recovered population via different protocols
- Adaptive management that is dynamic with status of wolf population and distribution
- Technical assistance to private landowners to decrease potential for negative livestock-wolf interactions

Management Plan

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Grizzly Bear (*Ursus arctos horribilis*)

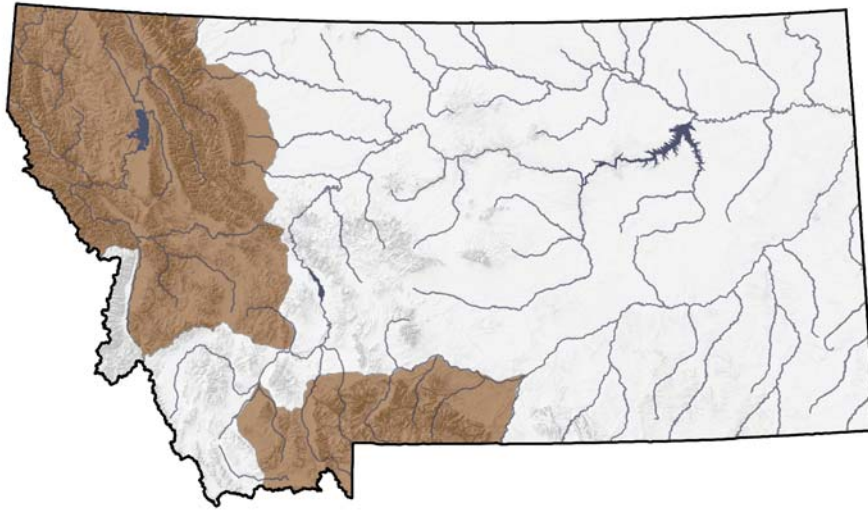


Figure 82. Distribution of the Grizzly Bear

Range

In Montana, grizzlies occur in Northwest Montana, extending through Glacier National Park, down the Bob Marshall Wilderness area, down to the Blackfoot River. Grizzlies are also found coming down east off the Rocky Mountain Front. Individuals may also be found in the Helena and Bitterroot National Forests. In addition, grizzlies are found in Yellowstone National Park and individuals are moving into the Absaroka-Beartooths Wilderness and in the Gallatin National Forests.

Habitat

In Montana, grizzlies primarily use meadows, seeps, riparian zones, mixed shrub fields, closed timber, open timber, side hill parks, snow chutes, and alpine slabrock habitats. Habitat use is highly variable between areas, seasons, local populations, and individuals (Servheen 1983, Craighead et al. 1982, Aune et al. 1984). Historically, the grizzly was also present on the plains occurring throughout most of eastern Montana.

Management

Current grizzly bear management throughout their range in Montana is dictated by their threatened listing under the Endangered Species Act (ESA). Under the ESA, no federal actions can cause further endangerment of grizzly bears. Federal land management agencies such as the U.S. Forest Service and the Bureau of Land Management must conduct management actions on their lands so that grizzly bears are not jeopardized. Interagency grizzly bear management

guidelines have been developed for these managed lands. In addition, the state of Montana has a Grizzly Bear Policy (MCA 12.9.103) that outlines policy guidelines for Montana Fish, Wildlife & Parks to promote the conservation of grizzly bears in Montana. Other regionally specific management plans include the Grizzly Bear Management Plan for Southwestern Montana 2002-2012 (Montana Fish, Wildlife & Parks 2002), and various tribal, National Forest, and National Park plans and policies. Most of these management plans are centered on three major themes: management of habitat to ensure grizzly bears have large expanses of suitable interconnected lands in which to exist management of grizzly/human interactions that most often result in death for the bears (and sometimes humans) involved (this is a particularly important concern for female bears because their removal may have significant impacts on the demography of isolated populations), and research to determine the population size and trends to ensure that grizzly bear populations are not being jeopardized. Please consult any of the management plans listed above for grizzly bear management specifics.

Conservation Concerns

- Human-bear and bear-livestock interactions
- Habitat loss and fragmentation
- Genetic fragmentation among Montana populations

Conservation Strategies

- Proactive management utilizing Montana citizens
- Protection of critical habitats through easements and other methods
- Ongoing research projects, including genetic analysis projects
- Continued interagency management efforts

Management Plans

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Black-footed Ferret (*Mustela nigripes*)

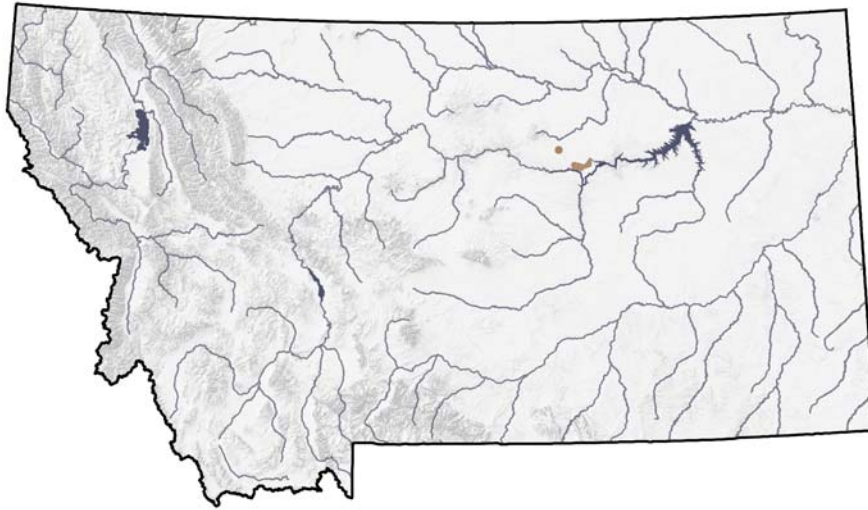


Figure 83. Distribution of the Black-footed Ferret

Range

Only a reintroduced population in southern Phillips is currently present. Historically, ferrets ranged throughout much of central and eastern Montana.

Habitat

Black-footed ferrets are intimately tied to prairie dogs (*Cynomys* spp.) throughout their range and have only been found in association with prairie dogs. They are therefore limited to the same open habitat used by prairie dogs: grasslands, steppe, and shrub steppe. Black-footed ferrets do not dig their own burrows and rely on abandoned prairie dog burrows for shelter. Only large complexes (several thousand acres of closely spaced colonies) can support and sustain a breeding population of black-footed ferrets. It has been estimated that about 40 to 60 hectares of prairie dog colony is needed to support one ferret, and females with litters have never been found on colonies less than 49 hectares (Miller et al. 1996). Ferrets scent-mark to maintain spatial separation (Richardson 1986).

Management

Black-footed ferrets have been extirpated from most of their former large range largely as a result of lost of habitat due to prairie dog control programs. Canine distemper, in conjunction with captures for captive breeding, resulted in extirpation of the last known wild population near Meeteetse, Wyoming by early 1987. See Miller et al. (1996) for more information on the discovery of the Meeteetse ferrets and subsequent distemper-caused decline and captive breeding decisions that occurred in 1985. All known populations are a result of

the reintroduction of captive bred ferrets from animals taken into captivity from this population. Reintroductions have occurred annually in Montana on federal and/or tribal land since 1994 with varying success. It is unknown why reintroductions in Montana have not established a self-sustaining population. Predation by coyotes and badgers, and long distance dispersal may be the primary problems with the reintroduction efforts. Disease, such as sylvatic plague has also apparently resulted in deaths for released animals. Some wild reproduction has occurred but no self-sustaining populations have been established yet.

Conservation Concerns

- Loss of habitat
- Disease such as canine distemper

Conservation Strategies

- Management of prairie dogs
- Continue disease surveys

Management Plans

Anderson, M. E. et al. 1978. Black-footed ferret recovery plan. U.S. Fish and Wildlife Service Black-footed ferret Recovery Team. 150 pp.

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Lynx (*Felis lynx*)

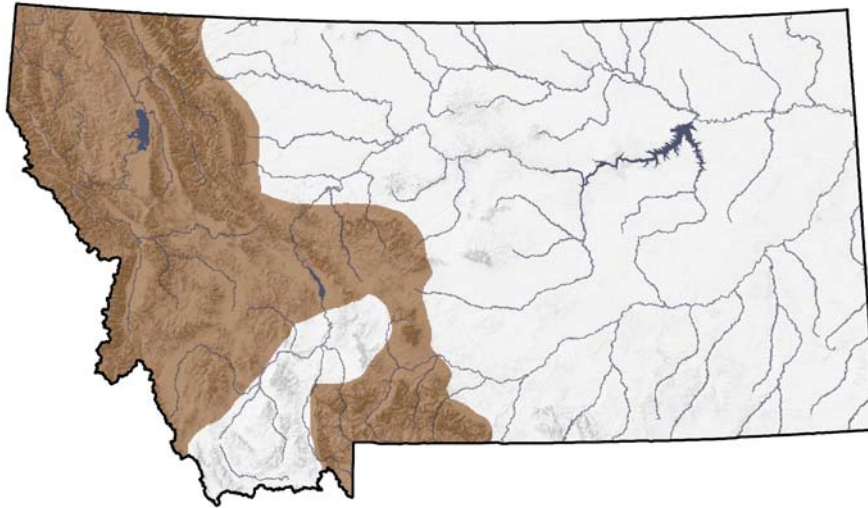


Figure 84. Distribution of the Lynx

Range

Canada lynx are limited to western mountains of Montana, however dispersers have been occasionally documented in eastern Montana.

Habitat

Canada lynx west of the Continental Divide generally occur in subalpine forests between 1,220 and 2,150 meters in stands composed of pure lodgepole pine but also mixed stands of subalpine fir, lodgepole pine, Douglas-fir, grand fir, western larch and hardwoods (J. Squires pers. comm. 1999 in Ruediger et al. 2000). In extreme northwestern Montana, primary vegetation may include cedar-hemlock habitat types (Ruediger et al. 2000). East of the Continental Divide the subalpine forests inhabited by lynx occur at higher elevations (1,650 to 2,400 meters) and are composed mostly of subalpine fir. Secondary habitat is intermixed Englemann spruce and Douglas-fir habitat types where lodgepole pine is a major seral species (Ruediger et al. 2000). Throughout their range, shrub-steppe habitats may provide important linkage habitat between the primary habitat types described above (Ruediger et al. 2000). Typical snow conditions are important factors for lynx, with lynx occurring primarily in habitats that also receive relatively uniform and moderately deep snowfall amounts (total annual snowfall of 100 to 127 centimeters) (Kelsall et al. 1977). Within these habitat types, disturbances that create early successional stages such as fire, insect infestations, and timber harvest, provide foraging habitat for lynx by creating forage and cover for snowshoe hares, although older forests also provide habitats for snowshoe hares and lynx for longer periods of time than disturbance-created habitats (Ruediger et al. 2000).

Canada lynx avoid large openings but often hunt along edges in areas of dense cover (Ruediger et al. 2000). When inactive or birthing, they occupy dens typically in hollow trees, under stumps, or in thick brush. Den sites tend to be in mature or old-growth stands with a high density of logs (Koehler 1990, Koehler and Brittell 1990). These habitats must be near or adjacent to foraging habitat because the hunting range of the female is reduced during this time (Ruediger et al. 2000).

In the South Fork Flathead, lynx were mostly located in fire-created, densely stocked young stands of lodgepole pine where snowshoe hares were most abundant. No locations in open or semi-open areas were observed (Koehler et al. 1979). In the Garnet Range, most were found in subalpine fir forest (Smith 1984). Denning sites are found in mature and old-growth lodgepole pine, spruce, and subalpine fir forests with a high density of logs (Koehler 1990, Koehler and Brittell 1990). Denning stands need not be large (1 to 3 hectares) but several stands should be interconnected (Koehler and Brittell 1990). Lynx require cover for stalking and security, and usually do not cross openings wider than 100 meters (Koehler and Brittell 1990).

Management

Canada lynx are classified as a furbearer in Montana but the trapping season is currently closed in Montana. Any lynx accidentally trapped must be released uninjured and reported to designated Fish, Wildlife & Parks employees within the trapping district within five days. Any lynx trapped that cannot be released unharmed must be reported to Fish, Wildlife & Parks for assistance to determine disposition and/or collection of the animal. The Canada Lynx was listed as a threatened species under the Endangered Species Act in the contiguous United States in 2000 because of the inadequacy of guidance for conservation of lynx in the National Forest Land and Resource Management Plans and Bureau of Land Management Land Use Plans (Ruediger et al. 2000). Subsequently, the Canada Lynx Conservation Assessment and Strategy (Ruediger et al. 2000) was produced to provide guidance for conservation measures on federally managed lands to ensure that lynx populations were not jeopardized by management of critical habitat. Please consult the plan for details of this strategy.

Conservation Concerns

- Habitat, specifically conifer loss and destruction
- Fragmented landscapes suppress principle prey (snowshoe hare) populations
- Road construction decreases connectivity and movement and increases potential for human disturbance
- Grazing increases competition for forage resources with lynx prey

Conservation Strategies

- Adequate management strategies between agencies to protect dense tree stands
- Conserve contiguous tracks of habitat
- Continue research on prey base such as snowshoe hare and red squirrel
- Maintain natural mosaic of forest by allowing low to medium level fires
- Manage forests for sustainable livestock grazing

Management Plan

Ruediger, Bill & 14 others on Lynx Biology Team. 2000. Canada Lynx Conservation Assessment and Strategy. 120 pp.

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American Bison (*Bos bison*)

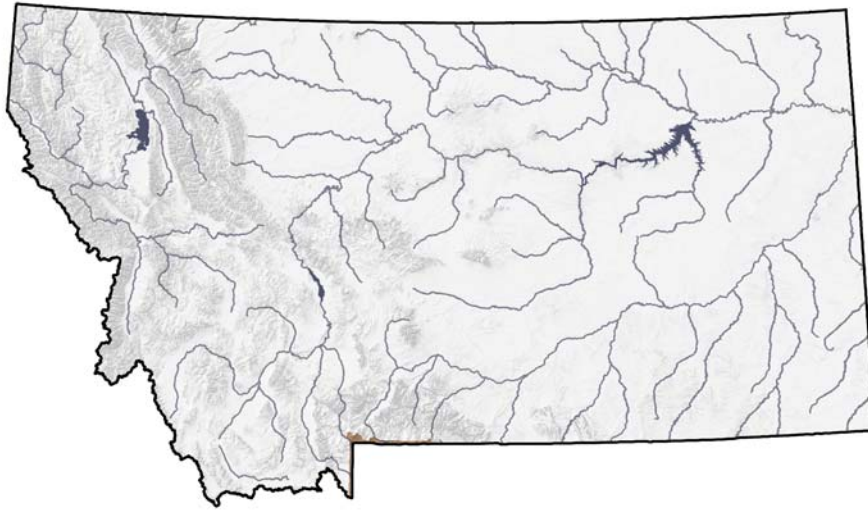


Figure 85. Distribution of the American Bison

Range

Free-ranging American bison in Montana are located only in areas surrounding Yellowstone National Park. Another semi-wild population occurs at the National Bison Range in northwestern Montana. American bison are also located on private ranches throughout Montana. The animals in Yellowstone National Park are partially descended from animals originally found in the park. Intervention has led to a genetically diverse a population with genetics derived from bison imported in the early 1900s mixed with remnant native bison following the great reduction in the 1800s. Other bison descended from 5 founder herds captured in various portions of the bison's former range, including Canada. Some were caught along the Milk River in Montana (Pattie and Hoffman 1992). American bison were formerly widespread in North America from Alaska and western Canada across the U.S. into northern Mexico.

Some American bison migrate out of Yellowstone National Park during the winter and these movements are more frequent and involve greater numbers of animals during years of heavy snow when populations are high, generally over 3000 individuals (National Academy of Sciences 1998). Recently, (1985-1986) harvest has resumed in response to Montana movements out of Yellowstone National Park. American bison at the National Bison Range are confined to the range and no migration is possible. This species previously made mass migrations across the prairie in spring and fall, with mountain populations moving to lower elevations in valleys.

Taxonomists recognize two subspecies of Bison, the plains and woodland bison that have distinct differences in habitat preference and historic range.

Habitat

Because of restrictions, currently occupied habitat does not reflect the full natural range for American bison. Throughout their range, American bison inhabit woodlands and open plains and grasslands. Woodlands and openings in boreal forest, meadows, and river valleys are used in the northern parts of their range. Like other large grazers, they are attracted to burn areas the next growing season (Shaw and Carter 1990). During the growing season at the Konza Prairie in northeastern Kansas, they preferred areas that had been burned in spring. Summer grazing was concentrated in large watershed area (79 to 119 hectares) dominated by warm-season, perennial C4 grasses. In fall and winter, they grazed both burned and unburned watersheds more uniformly, but grazed most intensively in areas with large stands of cool-season, C3 grasses (Vinton et al. 1993).

Management

Management of free-ranging American bison in Montana has been controversial. The presence of brucellosis in these animals and their migration out of Yellowstone National Park into adjacent public and private lands has led to conflicts between private landowners, citizens, public administrative agencies and public land management agencies. Free-ranging herds in Montana are currently managed under the Interagency Bison Management Plan. The current distribution of Yellowstone National Park bison and the management potential of this herd is limited to several very small areas outside of Yellowstone National Park where they can be tolerated and will not pose a disease risk to cattle grazing on surrounding habitats. It is unlikely that the distribution of bison in the Greater Yellowstone Area will dramatically change until brucellosis is eliminated from the herd. Efforts are currently being explored to isolate a brucellosis free population with acceptable genetics in order to establish free ranging herds outside Yellowstone National Park. Establishing this type of herd would require extensive cooperation from various federal and state agencies and private partners. If successful, these herds could serve to help restore the ecology of many community types in greatest need of conservation such as grassland complexes, mixed shrub/grass associations, woody draws and mixed broadleaf forests. Along with the restoration of these community types many associated species in greatest need of conservation could benefit (ex. prairie dogs, blackfooted ferrets, and swift fox).

Conservation Concerns

- Decreased natural areas for free roaming herds
- Disease (Brucellosis)
- Control issues for bison moving in and out of Yellowstone National Park

- Although suitable habitat exists, the Bison is ecologically extinct outside Yellowstone National Park
- Bison Genome has been eroded by unnatural management practices and introgression with domestic cattle genes
- Exclusion of Bison from management plans as part of the natural mammalian fauna in Montana eligible for regulated harvest

Conservation Strategies

- Establish a free ranging disease free Bison populations in suitable grassland habitats where they can function ecologically and operate as keystone species to restore grassland systems
- Preserve wild Bison genome through herd expansion and restoration projects in North America
- Continue development of working relationships with landowners
- Brucellosis control
- Create populations of wild bison that can be harvested and provide economic and social benefits to Montana

Management Plan

USDI National Park Service. 2000, Bison Management for the State of Montana and Yellowstone National Park. Final Environmental Impact Statement for the Interagency Bison Management Plan for the State of Montana and Yellowstone National Park. Vol. I. August 2000.

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Fish

White Sturgeon (Kootenai River Population) (*Acipenser transmontanus*)

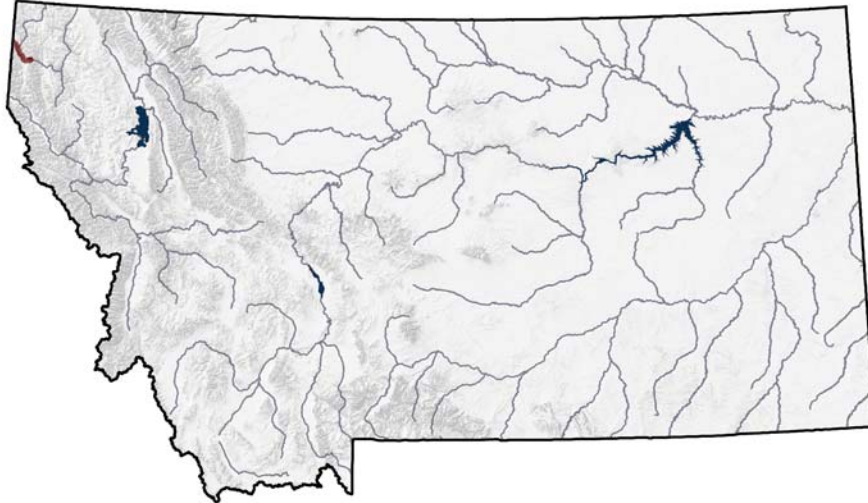


Figure 86. Distribution of the White Sturgeon

Range

The range extends from Kootenai Falls, Montana, located 50 river kilometers downstream of Libby Dam, to Corra Linn Dam at the outlet from Kootenay Lake, British Columbia. A natural barrier at Bonnington Falls downstream of Kootenay Lake isolated the white sturgeon in the Kootenai River from other populations in the Columbia River since the last ice age approximately 10,000 years ago (Alden 1953, Northcote 1973, Duke et al. 1999, USFWS 1999) (AFS website 2003).

Habitat

The white sturgeon is landlocked in Montana and live in large cool rivers (Kootenai).

Management

Recovery of the white sturgeon population in the Kootenai River is contingent upon re-establishing natural recruitment, minimizing additional loss of genetic variability, and successfully mitigating biological and habitat alterations that continue to harm the population. The White Sturgeon Recovery Plan (USFWS 1999) recommends simultaneous implementation of three high priority recovery approaches: 1) augment spring flows in the Kootenai River to enhance natural production; 2) implement a conservation aquaculture program to prevent extinction and preserve genetic variability; and 3) re-establish suitable habitat conditions to increase white sturgeon survival past the embryonic and larval

stages (AFS website 2003). The Kootenai River White Sturgeon Study and Conservation Aquaculture Project was initiated to preserve the genetic variability of the population, begin rebuilding natural age class structure, and prevent extinction while measures are implemented to restore natural recruitment (Anders and Westerhof 1996, USFWS 1999, Ireland 2000, Ireland et al. 2001 in press). A breeding plan has been implemented to guide management in the systematic collection and spawning of wild adults before they are lost from the breeding population (Kincaid 1993). The implementation of the breeding plan includes measures to minimize potential detrimental effects of conventional stocking programs (AFS website 2003).

Conservation Concerns

- Reduced spring flows, unnatural flow fluctuations and altered thermal regime caused by Libby Dam operation, may have interrupted spawning behavior and recruitment
- A suite of post-fertilization early life mortality factors (embryo suffocation, predation on early life stages, resource limitation) and possible intermittent female stock limitation have been reported as possibly contributing to observed recruitment failure for Kootenai River white sturgeon
- Habitat conditions in the spawning areas may also affect spawning and rearing success. Cessation of periodic flushing flows has allowed fine sediments to build up in the Kootenai River bottom substrates. Fine sediments fill interstitial spaces in riverbed cobbles, reducing fish egg survival, larval and juvenile fish security, cover and insect production

Conservation Strategies

- Coordinate flow fluctuations in Libby Dam as more natural
- Habitat conservation of surrounding terrestrial habitat
- Decrease fine sediments found in lake area
- Management of non-native species which may prey on young white sturgeon

Management Plan

U.S. Department of Interior, Fish and Wildlife Service. 1999. White Sturgeon; Kootenai River Population Recovery Plan. Region 1, USFWS, Portland, Oregon.

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Pallid Sturgeon (*Scaphirhynchus albus*)

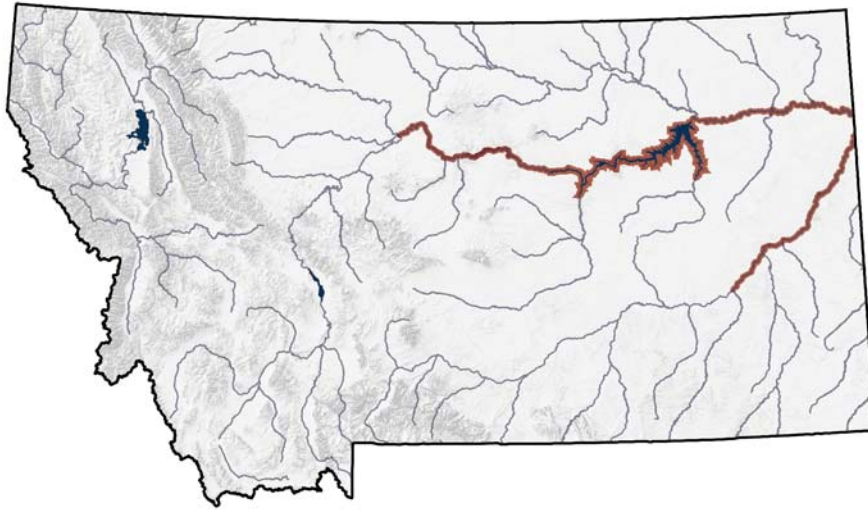


Figure 87. Distribution of the Pallid Sturgeon

Range

Pallid sturgeons are native in major rivers in eastern Montana including the Missouri River below Fort Benton and the Yellowstone River below the Carterville Diversion Dam near Forsyth.

Habitat

Pallid sturgeon use large, turbid rivers over sand and gravel bottoms, usually in strong current; also impoundments of these rivers (FWP). In Montana, pallid sturgeon use large turbid streams including the Missouri and Yellowstone rivers (Brown 1971, Flath 1981). They use all channel types, primarily straight reaches with islands (Bramblett 1996). They primarily use areas with substrates containing sand (especially bottom sand dune formations) and fines (93% of observations) (Bramblett 1996). Stream bottom velocities ranged between 0.0 and 1.37 meters per second, with an average of 0.65 meter per second (Bramblett 1996). Depths used were 0.6 to 14.5 meters and averaged 3.30 meters, and they appeared to move deeper during the day (Bramblett 1996). Channel widths from 110 to 1100 meters are used and average 324 meters (Bramblett 1996). Water temperatures used ranged from 2.8 to 20 degrees C. (Tews 1994, Bramblett 1996). Water turbidity ranged from 12 to 6400 NTU (Turbidity Units) (Tews 1994).

Management

Beginning in 1996, research efforts focused on pallid sturgeon recovery and preserving the pallid sturgeon genetic pool through stocking. The primary

purpose of the stocking program is to preserve the genetic pool and reconstruct an optimal population size within the habitat's carrying capacity (Krentz 1997a) (AFS website 2003). One of the most obvious detrimental changes in the pallid sturgeon environment was the damming of the Missouri River and several other important tributaries. Efforts are now being directed at restoring the river to a more normal condition. In 2000, the U.S. Fish and Wildlife Service (USFWS) completed an Endangered Species Act consultation with the U.S. Army Corps of Engineers regarding operation of Missouri River dams. Through an informal agreement the U.S. Bureau of Reclamation (BOR) has agreed to provide a dominant discharge spring pulse out of Tiber Reservoir every 4 to 5 years for Missouri River fish migrations which could help the Upper Missouri River pallid sturgeon population. To address pallid sturgeon passage and entrainment on the Yellowstone River, the USFWS has begun consultation with BOR regarding problems at Intake Diversion Dam. The future for pallid sturgeon recovery may continue to be uncertain even after positive changes have been implemented because pallid sturgeon populations are so depleted and the newly stocked fish will take at least 15 years before the females first reach sexual maturity and begin to spawn. Therefore, it is important to realize that immediate evaluations are impractical and recovery will take a dedicated, long-term commitment (AFS website 2003). Implementing the pallid sturgeon recovery program in this area is a multi-state and agency task. To facilitate this, the Montana/Dakota Pallid Sturgeon workgroup was organized in 1993. The group is comprised of representatives from FWP, NDGF, USFWS, USBOR, WAPA and PPL-MT, and acts in an advisory role identifying research needs and funding sources, developing work plans and providing an opportunity for communication between biologists and agency personnel (AFS website 2003).

Conservation Concerns

- Habitat modifications such as dams prevent movement to spawning and feeding areas, alter flow regimes, turbidity, and temperature, and reduce food supply
- Upstream and nearby, land use practices may degrade water quality
- Heavy metals and organic compounds may affect reproduction
- Hybridization with shovelnose sturgeon, possibly caused by reductions in habitat diversity

Conservation Strategies

- Movement of pallid sturgeons between upstream and downstream sections of dam impoundments
- Increased regulations of land use practice near riparian zones
- Increased regulations on point source runoff into streams

Management Plan

Dryer, M.P. and A.J. Sandvol. 1993. Recovery plan for the pallid sturgeon (*Scaphirhynchus albus*). U.S. Fish and Wildlife Service. Bismarck, ND. 55 pp.

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Paddlefish (*Polyodon spathula*)

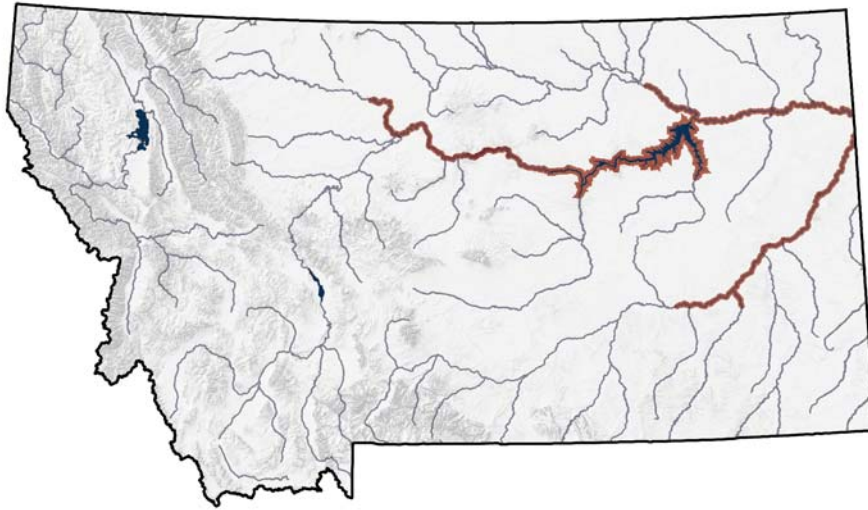


Figure 88. Distribution of the Paddlefish

Range

In Montana, two distinct paddlefish stocks are recognized. The Yellowstone-Sakakawea stock is distributed from the eastern boundary of the state up the Yellowstone River westward to the Cartersville Diversion Dam at Forsyth, as well as up the Missouri River westward to Fort Peck Dam (Scarnecchia et al. 1996b; Holton 2003). Most fish of this stock rear in Lake Sakakawea, a Missouri River mainstem reservoir in North Dakota (Fredericks and Scarnecchia 1997; Scarnecchia et al. 1997), and ascend the two rivers (mainly the Yellowstone) into Montana in spring to spawn (Firehammer 2004). Upriver distribution is more westerly in years of higher discharge. A few fish reside year-round in the Dredge Cuts below Fort Peck Dam. An important recreational snag fishery exists for this stock at the Intake Diversion Dam, near Glendive (Montana-North Dakota Paddlefish Management Plan 1995). Other sites on the Yellowstone River (e.g., Sidney Bridge, Richland Park, State Line) and on Missouri River below Fort Peck Dam (e.g., Wolf Point, Frazer Rapids) also are fished. A modest bow-and-arrow fishery also exists in the Dredge Cuts.

The Fort Peck stock is distributed from Fort Peck Dam up the Missouri River westward at least as far as the mouth of the Marias River (Berg 1981). Most fish of this stock rear in Fort Peck Reservoir, and ascend the river in spring to spawn. Upriver distribution is more westerly in years of higher discharge. Since the closure of Fort Peck Dam, Fort Peck stock fish have been isolated from fish below the dam, although some upriver fish can pass downstream. An important recreational snag fishery exists for this stock at several sites near the Fred Robinson Bridge (Scarnecchia et al. 2000).

Habitat

The paddlefish is a large river species that utilizes a wide variety of habitats seasonally and at different life stages. Optimal spawning habitat consists mainly of turbid, faster flowing main channel areas with gravel substrates, whereas feeding habitat is typically slower moving backwaters, side-channels and sloughs where their zooplanktonic food is more abundant. In the twentieth century, Montana's paddlefish have adapted successfully to feeding in Missouri River reservoir habitat, resulting in an increased population size over historical (pre-reservoir) levels (Scarnecchia et al. 1996b). Young-of-the-year paddlefish utilize turbid headwater reaches of Fort Peck Reservoir (Kozfkay and Scarnecchia 2002) and Lake Sakakawea (Fredericks and Scarnecchia 1997) for particulate feeding. Larger juveniles and adults large enough to more effectively avoid predation (Parken and Scarnecchia 2002) filter feed throughout the reservoirs.

Management

Historical information on the Yellowstone-Sakakawea stock and fisheries in the Yellowstone River is provided in Robinson (1966), Rehwinkel (1978), and a series of Federal Aid reports (e.g., Stewart 1984) as summarized in the Montana-North Dakota Paddlefish Management Plan (1995) and Scarnecchia and Stewart (1996). Socio-economic information on the anglers is provided in Scarnecchia et al. (1996), and Scarnecchia and Stewart (1997). Recent harvest data is summarized in a series of Federal Aid reports (e.g., Riggs 1999). Historical information on the Fort Peck stock and fisheries is provided by Berg (1981) and a series of Federal Aid reports (e.g., Needham 1984; Gilge and Liebelt 2001). Some of the latter reports also provide information on the Yellowstone-Sakakawea stock fish inhabiting the Dredge Cuts. Socio-economic information on the Fort Peck stock fishery is provided in Scarnecchia et al. (2000). Montana's goals, objectives, and approaches for paddlefish management are outlined in the Montana-North Dakota Paddlefish Management Plan (1995). This plan being revised and updated as of 2005. Management of the Yellowstone-Sakakawea stock is a cooperative, interstate effort involving coordinated and uniform management goals, objectives, data collection, and stock assessment by the Montana Department of Fish, Wildlife and Park and the North Dakota Game and Fish Department. For the Fort Peck stock, which is located entirely within Montana, management goals, objectives, data collection and stock assessment are designed where possible to be consistent with that of the Yellowstone-Sakakawea stock.

Harvest management for both stocks is designed to prevent over-harvest and insure sustainable wild fisheries. An extensive data collection program for the Yellowstone-Sakakawea stock has permitted a more rigorous scientific approach to harvest management. A harvest cap of 1,000 fish per state per year is intended to stabilize the population at its present level of about 30,000 adult fish. The harvest cap is considered a maximum acceptable harvest rather than a

target catch to be met. The number of fish allowed to be harvested is based on a straightforward harvest model involving determination of population size and age structure. Population size is estimated based on jaw-tag recoveries from adult fish. Biologists accurately estimate and validate the ages of the fish caught in the fishery (Scarnecchia et al. 2005) to insure that young adult fish are added, and old fish retained, in the stock. The harvest cap is set to not exceed the most recent 5-year estimated recruitment of young adults (ages 10-14 males and ages 17-21 females). Monitoring and stock assessment approaches for the Fort Peck stock (including population estimation and age determination) are being developed to permit the implementation of a similar approach to harvest management for that stock. No harvest cap for that stock currently exists. Harvest regulations differ for the two stocks. For the Yellowstone-Sakakawea stock, harvest regulations on the Yellowstone River include an open season from May 15 through June 30, or until the harvest cap is reached. In the Missouri River below Fort Peck Dam, harvest is open all year or until the harvest cap is reached. All snagged paddlefish must be retained and tagged with a locking individually-identifiable paddlefish tag purchased by the angler. The annual bag limit for this stock is one fish per person. Catch-and-release fishing (with mandatory release), which when monitored has been shown to not cause excessive mortality (Scarnecchia and Stewart 1997b), is also permitted for two six-hour periods per week at the Intake fishing site. For the Fort Peck stock, anglers may harvest up to 2 fish per year (but only one if the angler caught one from the Yellowstone-Sakakawea stock). The season is open all year, and high-grading (immediate release of captured fish) is permitted (Montana Department of Fish, Wildlife & Parks 2005). No limit is set on the total number of tags sold for either stock.

For both stocks, extensive collection of harvest data as well as adult tagging and juvenile monitoring are conducted to obtain information on age composition, population size, reproductive success, and recruitment of young adult fish. On-site and telephone creel surveys provide additional information on the fishery and harvest.

Conservation Concerns

- Loss of spawning habitat. Paddlefish spawn most effectively in turbid, free-flowing rivers with natural hydrographs and gravel, cobble and perhaps sand substrates.
- Water depletions. Excessive and increasing water depletions for irrigation during drought or low-flow years influence paddlefish migratory and spawning behavior. Adequate flows in spring and early summer are needed to initiate spawning migrations.
- Decreasing quality of rearing habitat in impoundments. Extensive sedimentation of Missouri mainstem reservoirs, including the headwater depositional areas, will reduce available habitat, especially for young fish.

- 11711 Reservoir drawdowns for downriver water uses decreases available
11712 habitat and food, and exposes young fish to greater predation.
11713 • Potential introduction of exotic competitors (e.g. bighead carp, *Aristichthys*
11714 *nobilis*)
11715 • Over-fishing. Although much progress has been made to prevent legal
11716 over-fishing, vigilance is needed to prevent illegal harvest.
11717

11718 **Conservation Strategies**

- 11719
11720 • Maintenance of instream flows and spawning habitat in large rivers
11721 (especially the Yellowstone River and Missouri River above Fort Peck
11722 Reservoir)
11723 • Improving harvest management
11724 • Increased reservoir water retention during times of drought
11725 • Improved public awareness of paddlefish conservation concerns
11726

11727 **Management Plan**

- 11728
11729 Montana-North Dakota Paddlefish Management Plan. 1995. North Dakota Game
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Shortnose Gar (*Lepisosteus platostomus*)

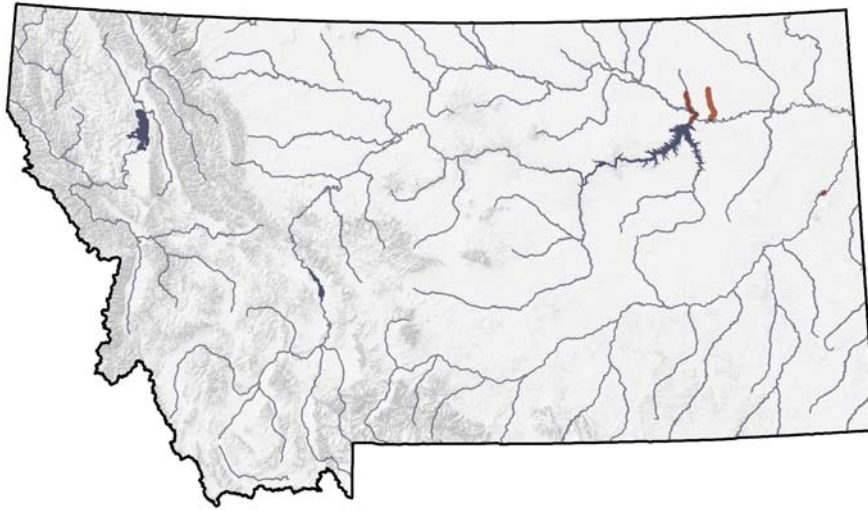


Figure 89. Distribution of Shortnose Gar

Range

The distribution of shortnose gar within Montana is very limited, with their presence being documented primarily in the Missouri River dredge cuts downstream of Fort Peck Dam (Brown 1971). The only other documented observation of shortnose gar in Montana is a single specimen collected on the Yellowstone River approximately 15 miles upstream of its confluence with the Missouri River in 1998 (K. Kapuscinski, FWP, personal communication, February 2003) (AFS website 2003).

Habitat

Due to their limited distribution little is know about shortnose gar within the State of Montana. Shortnose gar is typically found in large rivers, quiet pools, backwaters, and oxbow lakes. It has a higher tolerance to turbid water than the other four gar species found in North America. Gar also have the unique ability to supply a high vascularized swim bladder with supplemental oxygen by engaging in a behavior of “breaking” where air is gulped at the surface (Pflieger 1975). This allows gar to occupy waters with extremely low dissolved oxygen concentrations, which would not be suitable for most other fish inhabitation. They are found in dredge cuts below Fort Peck Dam (Holton 2003).

Management

Due to low numbers and poor quality flesh, the shortnose gar is not considered a sport fish in Montana (AFS website 2003).

Conservation Concerns

- Limited information in Montana
- Limited habitat used in Montana
- Backwater habitat filled in for agriculture & modified by lack of channel primarytenance flows
- Cold water release, lack of turbidity and artificial hydrograph below Ft. Peck Dam may inhibit abundance in lower Missouri

Conservation Strategies

- Consider preparing management plan for Shortnose Gar or inclusion into other comprehensive taxonomic plan
- Increase survey and monitoring efforts
- Increase conservation initiatives for backwater sloughs and channels
- Regulate water regimes to be more closely tied to natural water regimes

Management Plan

None

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Yellowstone Cutthroat Trout (*Oncorhynchus clarki bouvieri*)

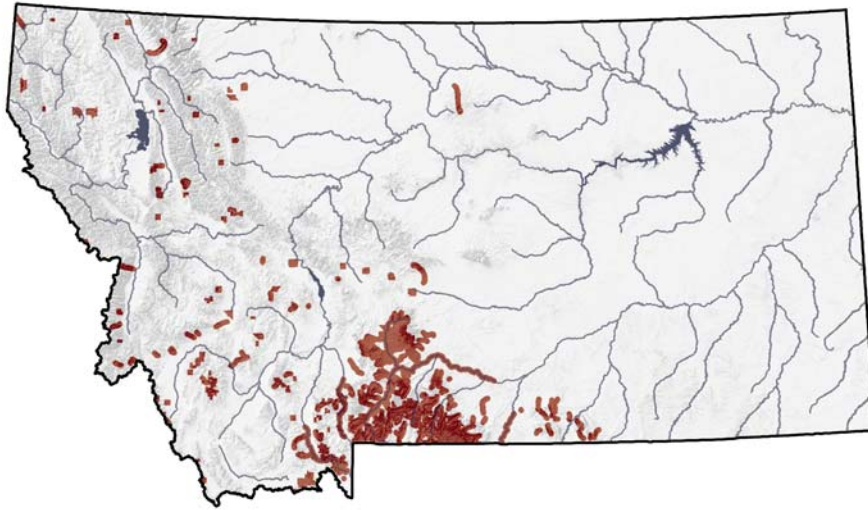


Figure 90. Distribution of the Yellowstone Cutthroat Trout

Range

Historically, Yellowstone cutthroat trout were believed to have occupied much of the Yellowstone River basin, including portions of the Clarks Fork of the Yellowstone River, Bighorn River, and Tongue River basins in Montana and Wyoming, and parts of the Snake River basin in Wyoming, Idaho, Utah, and Nevada (Behnke 1992). The lower portions of some primary-stem rivers e.g., the Tongue River may have been too warm to support populations. Range wide, Yellowstone cutthroat trout have undergone substantial declines in distribution and abundance. Populations in Utah and Nevada are limited to 1-2 basins (May 1996). Based on a survey of biologists, May (1996) concluded that in Idaho, Yellowstone cutthroat trout occupied 43% of their historical range, in Wyoming 42%, and in Montana, 32%. Most remaining indigenous populations in Montana inhabit headwater streams, though the Yellowstone River primary stem also supports large numbers of this subspecies. More recent estimates suggest that in Montana 10% of the historically occupied fluvial habitat still contains genetically pure populations (May 1998; Anonymous 1999). Yet all these estimates must be regarded as approximations because many waters in its historical range were probably barren of fish because of barriers to upstream migration (May 1996; Dufek et al. 1999). Also, stocking in previously barren waters in historically occupied basins has been commonplace. For example, in Montana only 2-6 lakes historically were occupied, whereas over 100 lakes now support genetically pure Yellowstone cutthroat trout (May 1996; May et al. 1998). Finally, recent comprehensive field surveys of Montana waters are lacking. Similar surveys in northwestern Wyoming outside Yellowstone National Park revealed that of 1,700 km of potential historical habitat, only 245 km contained reasonably genetically pure Yellowstone cutthroat trout distributed in four

populations, all of which had been exposed to introgression with Snake River fine-spotted cutthroat trout (Kruse et al. 2000).

Habitat

Yellowstone cutthroat trout inhabit relatively clear, cold streams, rivers, and lakes. Optimal temperatures have been reported to be from 4 to 15 degrees C., with occupied waters ranging from 0 to 27 degrees C. (Gresswell 1995) (AFS website 2003).

Management

To maintain healthy populations of Yellowstone cutthroat trout and to ensure the wide-ranging persistence of this subspecies in Montana and elsewhere, a number of tactics have been proposed in recent status assessments (Yellowstone Cutthroat Trout Working Group 1994, Gresswell 1995, May 1996, May et al. 1998, Anonymous 1999, Dufek et al. 1999, Wyoming Game and Fish Department 2000). These include field surveys, harvest management, habitat protection and improvement, non-native species control, and broodstock management (AFS website 2003).

Conservation Concerns

- Persistence of non-native fish
- Widespread stocking of non-indigenous populations of Yellowstone cutthroat trout
- Susceptibility to infection by *Myxobolus cerebralis*, a European protozoan and the causative agent of whirling disease
- Tributary dewatering by unsustainable irrigation practices
- Culverts, dams, irrigation diversions or other instream barriers that fully or partially impede fish movement and reduce connectivity of habitat
- River channelization or rip rap
- Unsustainable grazing, mining, logging, and road building

Conservation Strategies

- Decrease stocking of non-native trout
- Decrease stocking of non-indigenous Yellowstone Cutthroat Trout to decrease genetically homogenization
- Increased funding for studying whirling disease
- Decreased channels and irrigation developments

Management Plans

Cooperative Conservation Agreement for Yellowstone Cutthroat Trout within Montana between Crow Tribe, Montana Department of Fish, Wildlife & Parks

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Westslope Cutthroat Trout (*Oncorhynchus clarki lewisi*)

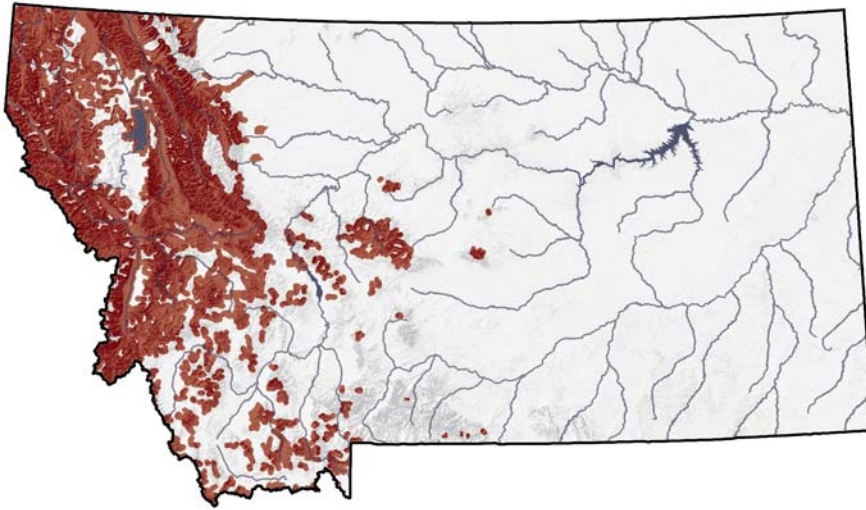


Figure 91. Distribution of the Westslope Cutthroat Trout

Range

The westslope cutthroat trout is found in the Kootenai watershed, the Clark Fork watershed, the headwaters of the Missouri River and the headwaters of the Saskatchewan River. Westslope cutthroat trout were first described by Lewis and Clark and were once extremely abundant. Unfortunately, the species has lost a lot of ground. Various studies have estimated that the westslope cutthroat trout now only occupies between 19 to 27% of its historic range in Montana and about 36% of its historical range in Idaho (Van Eimeren 1996). But westslope cutthroat trout can hybridize with other cutthroat trout subspecies and rainbow trout. Thus, genetically pure westslope cutthroat trout are estimated to exist in only 2 to 4% of their historic stream distribution (McIntyre and Rieman 1995). East of the Continental Divide, westslope cutthroat trout are confined to headwater reaches, and most of these small populations face an extremely high risk of extinction (AFS website 2003).

Habitat

Spawning and rearing streams tend to be cold and nutrient poor. Westslope cutthroat trout seek out gravel substrate in riffles and pool crests for spawning habitat. Cutthroat trout have long been regarded as sensitive to fine sediment (generally defined as 6.3 millimeters or less). Although studies have documented negative survival as fine sediment increases (Weaver and Fraley 1991), it is difficult to predict their response in the wild (McIntyre and Rieman 1995). This is due to the complexity of stream environments and the ability of fish to adapt somewhat to changes in microhabitat (Everest et al. 1987) (AFS website 2003).

Westslope cutthroat trout also require cold water, although it has proven elusive to define exact temperature requirements or tolerances. Likewise, cutthroat trout tend to thrive in streams with more pool habitat and cover than uniform, simple habitat (Shepard, Pratt and Graham 1984). Juvenile cutthroat trout overwinter in the interstitial spaces of large stream substrate. Adult cutthroat trout need deep, slow moving pools that do not fill with anchor ice in order to survive the winter (Brown and Mackay 1995) (AFS website 2003).

Management

Management of this species involves protecting the population strongholds and making tough decisions on restoration priorities for the depressed populations. The State of Montana has altered fishing regulations to reduce fishing mortality. Montana has also developed a Conservation Agreement signed by nine government agencies and conservation groups (Montana Department of Fish, Wildlife & Parks 1999). This agreement prioritizes protecting genetically pure populations first, then slightly introgressed populations. Recovering depressed populations will involve habitat restoration and removing non-native species. To a large degree management activities are different between the west of the Continental Divide (focus on barriers and non-native trout) and east (focus on habitat restoration). Research suggests that it is not a good idea to bolster populations with stocked fish from other watersheds due to considerable genetic variation between watersheds (Leary, Allendorf and Kanda 1998). It will be especially challenging to recover migratory life forms. Governmental agencies will need to work together to share expertise, pool financial resources and monitor progress toward restoration of this species (AFS website 2003).

Conservation Concerns

- Habitat loss due to unsustainable grazing or logging practices, mining, agriculture, residential development and the impact of forest roads
- Fish spawning habitat loss due to dewatering of streams for irrigation and because of barriers created by dams and road culverts
- Over competition and predation by non-native species
- Increased hybridization with other species
- Isolated and small population sizes
- Overfishing

Conservation Strategies

- Reduce limits on westslope cutthroat trout
- Educate the public and outreach on need of westslope cutthroat trout
- Increase stock populations of genetically pure westslope cutthroat trout
- Continue to conserve genetically pure populations
- Increase limits of non-native fish
- Conservation of habitat, including better natural resource use practices

- Removal of nonnative fish where appropriate
- Creation of barriers to protect remaining populations
- Reintroduction of Westslope Cutthroat

Management Plans

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Columbia Basin Redband Trout (*Oncorhynchus mykiss gairdneri*)

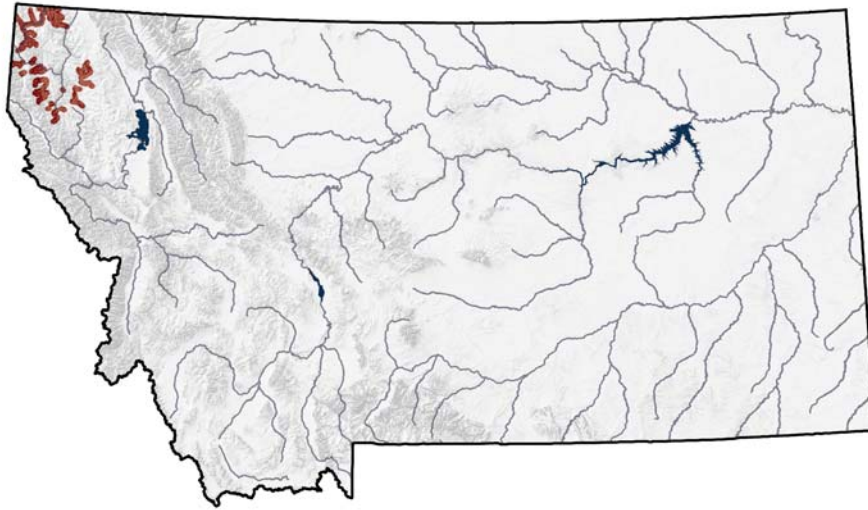


Figure 92. Distribution of the Columbia Basin Redband Trout

Range

The Kootenai River drainage population of redband trout is Montana's only native rainbow trout and represents the furthest inland penetration of redband trout in the Columbia River Basin. Until recently, the upper distribution of redband trout in the Columbia River Basin was believed to extend upstream to Kootenai Falls, which was considered a barrier falls located approximately 8 km east of Troy, Montana (Allendorf et al. 1980). Recent information suggests that the barrier was not Kootenai Falls, but existed in geologic time near the present day Libby Dam or Fisher River (Hensler et al. 1996).

Presently, populations of redband trout have been identified using starch gel electrophoresis in the following streams in the Kootenai River drainage in Montana: Callahan Creek, North Fork Yaak River and East Fork Yaak River, upper Libby Creek and several tributaries, and several tributaries to Fisher River including Wolf Creek (Allendorf et al. 1980; Leary et al. 1991; Huston 1995; Hensler et al. 1996; M. Hensler MFWP, personal communication).

Results of genetic surveys indicate that redband trout historically preferred low-gradient valley-bottom streams throughout the Kootenai River drainage but are presently restricted to headwater areas or streams with barriers. Allendorf et al. (1980) concluded that redband trout is a native rainbow trout to the Kootenai River, Montana, and that "planting of hatchery rainbow trout has created a situation of tremendous genetic divergence among local populations" (e.g. hybridization).

The Kootenai redband trout are effectively separated into two primary regions, those below Kootenai Falls and those above. Fish of the size known to inhabit these streams may mix downstream but are unlikely to traverse up the falls (Chapman 1986). Below Kootenai Falls, redband trout inhabiting Callahan Creek and the upper Yaak River Drainage are isolated into two separate regions by Yaak River Falls, a falls-chute barrier located 4 km from the mouth of Callahan Creek and a barrier falls located in the lower East Fork of the Yaak River. These remnant populations, which are spatially fragmented and isolated from genetic exchange, represent the only known remaining sources of native redband trout capable of re-founding their historic distribution in Montana downstream of Kootenai Falls.

There are no barriers to protect redband trout from hybridization upstream of Kootenai Falls. Still, there are several tributaries to Fisher River drainage and Libby Creek drainage that maintain non- or nearly non-introgressed populations and could be used for re-founding if necessary (M. Hensler MFWP, personal communication).

Perkinson (1993) hypothesized that of 300 km of habitat originally used by redband trout in Montana, only 100 km (33%) of their historic range is presently occupied by a stock that is at least 95% pure. More recent genetic evaluation of the species showed the historic range was more on the order of 1200 km and current is 493 km. The current distribution includes instances where redband trout are sympatric with westslope cutthroat trout. These populations show small first generation hybridization and almost no post-first generation hybridization. Approximately 152 km or 13 percent of the historic distribution is relatively invasion due to barriers in the Callahan Creek and Yaak River drainages.

Habitat

The seasonal habitat requirements of redband trout in the Kootenai River drainage in Montana were investigated in the Kootenai River drainage during 1997 and 1998 (Hensler and Muhlfeld 1999; Muhlfeld 1999; Muhlfeld et al. 2001 In-press). Summer results demonstrated that juvenile (36-125 mm) and adult (≥ 126 mm) redband trout prefer deep microhabitats (≥ 0.4 m) with low to moderate velocities (≤ 0.5 m/s) adjacent to the thalweg. Conversely, age-0 (≤ 35 mm) redband trout select slow water (≤ 0.1 m/s) and shallow depths (≤ 0.2 m) located in lateral areas of the channel. Age-0, juvenile and adult redband trout strongly select pools and avoided riffles; runs were used generally as expected (based on availability) by juveniles and adults and more than expected by age-0 redband trout. At the macrohabitat scale, a multiple regression model indicated that low-gradient, mid-elevation reaches with an abundance of complex pools are critical areas for the production of redband trout. Mean reach densities ranged from 0.01-0.10 fish/m². During the fall and winter period, adult redband trout occupied small home ranges and found suitable overwintering habitat in deep pools with extensive amounts of cover in headwater streams. In Basin Creek, adult

redband trout commenced spawning (e.g. redd construction) during June as spring flows subsided following peak runoff. Redband trout generally selected redd sites in shallow pool tail-out areas (mean depth = 0.27 m; range: 0.20-0.46) with moderate water velocities (mean velocity = 0.50 m/s; range: 0.23-0.69 m/s) dominated by gravel substrate.

Management

Long-term conservation and management of this subspecies will require state and federal agencies to develop a comprehensive plan to protect and restore redband trout throughout their native range in Montana. First and foremost, the populations that are non-introgressed must be protected and where necessary enhanced through habitat improvements. Maintaining channel complexity and quality pool habitat throughout their limited range is probably essential to the persistence of this subspecies in Montana. Montana Fish, Wildlife & Parks and the U.S. Forest Service and local conservation groups have scheduled future habitat improvement and conservation efforts for the foreseeable future.

Another objective should be consideration reintroductions throughout the Kootenai River drainage in the historic range for redband trout. To that end, MFWP are in the process of assessing redband trout performance at the Libby Field Station and Murray Springs State Fish Hatchery and in two lakes (M. Hensler, personal communication). Results of microsatellite analyses based on allozyme electrophoresis of several populations of redband trout in Montana and British Columbia indicate significant differences between watersheds and relatively small differences between populations within watersheds (Knudsen et al. 2002). In order for potential reintroduction programs to be genetically rational, drainage-specific stocks are needed for successful recovery programs.

Habitat surveys should be conducted to identify streams suitable for reintroductions of redband trout. However, re-introduction efforts should be implemented with caution because introduction of a species to any aquatic habitat requires many considerations because species interactions are complex and difficult to predict (Li and Moyle 1981).

Conservation Concerns

- Land and water use practices, such as logging, grazing and use of pesticides
- Culverts, dams, irrigation diversions or other instream barriers that fully or partially impede movement and reduce connectivity of habitat
- Hybridization
- Geographical restricted range

Conservation Strategies

- Consider preparing management plan for Columbia Basin Redband Trout or inclusion into other comprehensive taxonomic plan
- Reduce stocking of non-native trout in sensitive areas
- Protect genetic composition by raising hatchery Columbian Basin Redband Trout
- Management of riparian zones and waters where Redband Trout reside
- Reduce stream intake of pesticides and herbicides

Management Plan

None

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Bull Trout (*Salvelinus confluentus*)

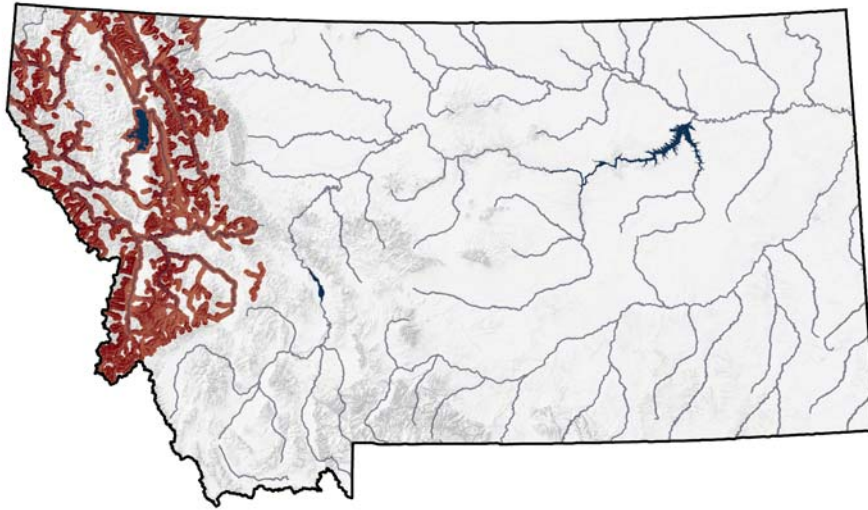


Figure 93. Distribution of the Bull Trout

Range

Montana populations are limited to the Columbia and Saskatchewan River basins. Major bull trout drainages are the Kootenai River, Clark Fork River (including Bitterroot, Flathead/Swan and Blackfoot River systems). Metaline Falls (Tom Weaver, FWP, personal communication) and Bonnington Falls have isolated Clark Fork and Kootenai River populations from downstream Columbia basin populations for approximately 10,000+ years (Montana Bull Trout Restoration Team (MBTRT) 2000). The St. Mary's River in the Saskatchewan basin, draining north into Canada, contains the only bull trout populations east of the continental divide in the United States.

Habitat

Sub-adult and adult fluvial bull trout reside in larger streams and rivers and spawn in smaller tributary streams, whereas adfluvial bull trout reside in lakes and spawn in tributaries. They spawn in cold headwater streams with clean gravel bottom (Brown 1971, Holton 1981).

Management

Several studies report bull trout local population genetic divergence down to the geographic scale of adjacent tributaries (Leary et al. 1993; Kanda et al. 1997; Spruell et al. 1999; Taylor et al. 1999). Based on similar patterns of population genetic structure in steelhead, Parkinson (1984) suggested that populations in geographically adjacent streams be managed as separate stocks.

Because of their opportunistic feeding habits and late maturity, bull trout are vulnerable to overharvest and poaching/accidental harvest, especially during spawning migrations and when in tributaries (Leathe and Enk 1985, Long 1997, Schmetterling and Long 1999, Carnefix 2002). Some Montana bull trout populations (e.g. Swan, South Fork Flathead, Kootenai, and Blackfoot) have responded well to more restrictive angling regulations or closures (Tom Weaver, FWP, personal communication), and initial conservation efforts in Montana focused on such measures. The first minimum length limit was imposed in 1951 (Long 1997). From 1953 to 1972, 11 of 33 major North and Middle Fork Flathead River spawning tributaries were closed to fishing and an 18-inch minimum size limit was established in 1982 to protect pre-spawners in the rivers and Flathead Lake was in effect (Fraley et al. 1981; Deleray et al. 1999). Regulations closing all state waters except Swan Lake and Hungry Horse Reservoir to intentionally fishing for and/or harvesting bull trout became effective in 1993 (Deleray et al. 1999). Harvest is currently permitted in Swan Lake, Hungry Horse Reservoir (South Fork Flathead) and Koocanusa Reservoir (Kootenai). Some level of poaching (Swanberg 1996; Long 1997) and accidental harvest due to misidentification (Schmetterling and Long 1999) probably continues to impact bull trout populations, but is difficult to detect, quantify, prosecute or prevent. Recent efforts to reduce misidentification include a Bull Trout Identification and Education webpage at the FWP website (<http://fwp.state.mt.us/bulltroutid/default.htm>).

The state of Montana began development of a bull trout restoration plan in 1993. The final plan, published in June 2000, identifies 115 bull trout core areas and connecting “nodal habitat” within twelve Restoration/Conservation Areas (RCAs); sets goals, objectives and criteria for restoration; outlines actions to meet those criteria; and establishes a structure to monitor implementation and evaluate effectiveness of the plan. The stated goal of the plan is “to ensure the long-term persistence of complex (all life histories represented), interacting groups of bull trout distributed across the species’ range and manage for sufficient abundance within restored RCAs to allow for recreational utilization” (MBTRT 2000). Bull trout conservation is also a stated goal of the Plum Creek Timber Company’s Native Fish Habitat Conservation Plan (HCP) (<http://www.plumcreek.com/environment/HCP-fish.cfm>), for which agreement was reached with the USFWS in October 2000. Though approved, this HCP/take permit is currently in litigation.

With “threatened” listing (USFWS 1998), USFWS has separate responsibility under the Endangered Species Act for development of a federal recovery plan and designation of critical habitat. A draft Recovery Plan built on the foundation of state restoration plans (USFWS 2002a, Internet-accessible at <http://pacific.fws.gov/bulltrout/recovery/Default.htm>) and proposed critical habitat (USFWS 2002b, <http://pacific.fws.gov/bulltrout/criticalhab.htm>), were released. Although all bull trout within the U.S. are now listed as threatened, this draft Recovery Plan and proposed critical habitat are organized hierarchically by “local

populations” within “core areas” within “recovery subunits” within 24 “recovery units” within three (of five) designated “distinct population segments” (DPSs). The draft Recovery Plan covers the Klamath basin, Columbia River and St. Mary-Belly River DPSs. Although extensive bull trout habitat was proposed for critical designation in Montana, including 5,341 stream km (3,319 miles) and 88,051 ha (217,577 ac) of lake and reservoir, the final critical habitat designation did not include any habitat in Montana. Ten local populations within four core areas have been identified within the Kootenai River Recovery Unit in Montana. About 119 local populations distributed among 36 core areas within three Recovery Subunits (Flathead, Upper and Lower Clark Fork) are identified within Montana in the Clark Fork Recovery Unit. Nine local populations within six core areas are identified within Montana in the St. Mary-Belly River Recovery Unit.

Conservation Concerns

- Habitat degradation and loss due to land and water management practices
- Isolation and fragmentation of populations by both structural (e.g. dams) and environmental (e.g. thermal or pollution) barriers
- Introduction of non-native fishes resulting in competition, predation and hybridization threats
- Historical eradication efforts
- Historical overharvest
- Ongoing poaching and accidental harvest due to misidentification
- Loss of the migratory component of bull trout life history diversity

Conservation Strategies

- Restoration of degraded habitat and preservation of existing healthy habitat
- Reestablish connectivity between habitats isolated by constructed barriers
- Prevent illegal introductions of fish species
- Management of water bodies from overfishing
- Increased management of non-native fishes
- Education of what bull trout look like and where they are distributed

Management Plans

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Lake Trout (native lakes) (*Salvelinus namaycush*)

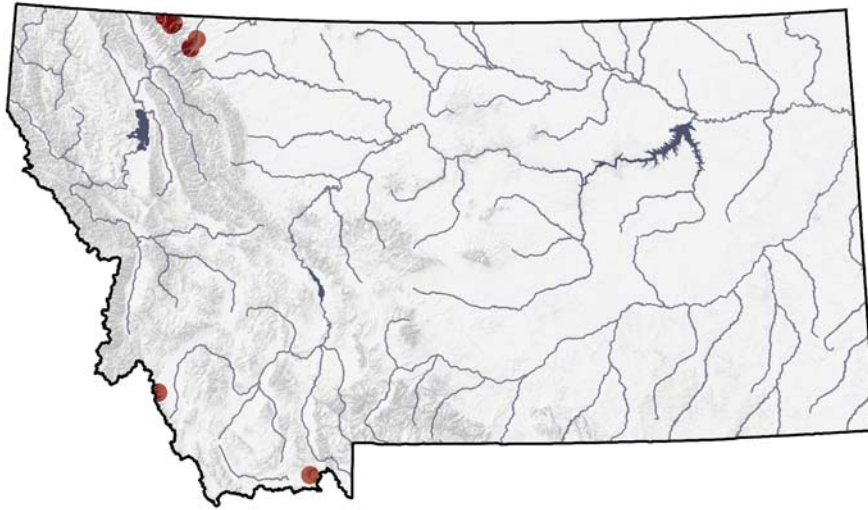


Figure 94. Distribution of Native Populations of lake Trout

Range

Montana's native lake trout populations remain in Waterton Lake, Glens Lake, Cosley Lake, and St. Mary Lake in Glacier National Park and Lower St. Mary Lake in the Blackfoot Indian Reservation. All of these waters are in drainages that eventually reach Hudson Bay. Other native populations occur in Twin Lake in the Big Hole River drainage and Elk Lake in the Red Rock River drainage, both tributaries to the upper Missouri River drainage. Although there are records of some stocking of lake trout into Cosley, Glenn and Lower St. Mary lakes, mtDNA analysis by Wilson and Hebert (Wilson and Hebert 1998) gives evidence of the native status of the listed populations. Other lake trout populations in Montana are the result of legal and illegal introductions and are not remnant native populations.

Habitat

While lake trout can be found in cold rivers and shallow lakes in the northern portion of its range, (Scott and Crossman 1973) in Montana native lake trout inhabit a few deep, cold lakes remaining from the Pleistocene glaciations. Lake trout prefer water temperatures in the 50-57°F range and, therefore, spend most of their lives in the deeper, benthic habitats with these water temperatures. Lake trout can occasionally be found in shallow water habitats, usually immediately after ice-out when surface waters are within their preferred temperature range. They spawn in the fall on the rocky substrate of the shoreline. They scatter or broadcast their spawn, a rarity in the trout group.

Management

Management recommendations within this document pertain only to Elk Lake and Twin Lake populations. Little is known about the status of Montana's native lake trout populations. The populations in Waterton, Cosley, Glenns and St. Mary lakes are afforded the protection of their location within Glacier National Park. The Waterton population is believed to be abundant and stable. (Leo Marnell, NPS, personal communication).

St. Mary Lake is a 3500 acre lake at 4473 feet above mean sea level. The St. Mary Lake population is believed to be abundant and stable. Lake trout are the most dominant fish species after lake whitefish. There are records of stocking lake trout into St. Mary Lake so the genome of this population may contain exotic alleles. DNA analysis has been performed, but not reported, to identify the source stock for these introductions. (Leo Marnell, NPS, personal communication, Robbin Wagner, USFWS, personal communication).

Some question whether the Glenns and Cosley lakes populations are native due to the location of a downstream high barrier falls. (Leo Marnell, NPS, personal communication). Holton and Johnson 1996 did not list these as native populations; however, Wilson and Hebert 1998 found that there is genetic evidence that the Cosley Lake haplotype is consistent with the other populations that formed the Alberta/Montana refuge. The Cosley and Glenns lakes populations are believed to be stable. There are records of stocking lake trout of unknown origin into Cosley and Glenns lakes, so the genome of these populations may contain exotic alleles. DNA analysis has been performed, but not reported, to identify the source stock for these introductions. (Leo Marnell, NPS, personal communication, Robbin Wagner, USFWS, personal communication).

Lower St. Mary Lake is located within the Blackfeet Indian Reservation. This population is stable and abundant. Lake trout are the most dominant fish species after lake whitefish and comprise 10-30% of the commercial lake whitefish catch. Again, there are records of stocking lake trout of unknown origin into Lower St. Mary Lake. Water level fluctuations and dewatering due to lake management for irrigation impacts this population. (Robbin Wagner, USFWS, personal communication)

Elk Lake is a 283 surface acre lake at 6674 feet elevation with a maximum depth of 70 feet. (USFS, 2004). The population in Elk Lake is small (250-1000 fish) and declining. This population has a poor age structure due to limited recruitment. (Oswald, unpublished FWP data)

Twin Lake is a 75 surface acre lake at 7235 feet elevation with a maximum depth of 72 feet. (USFS, 2004). The Twin Lake population is also small (50-250 fish), declining, with little recruitment. (Oswald, unpublished FWP data)

The genetic uniqueness and significance of Montana's lake trout populations to the post-glacial distribution of the species mandate that these remnant native populations be conserved.

Conservation Concerns

- Little information on native populations
- Irregular recruitment
- Genetic bottlenecks caused by small size of remaining populations
- Limiting factors unknown

Conservation Strategies

- Consider preparing management plan for Native lakes Lake Trout or inclusion into other comprehensive taxonomic plan
- Increased monitoring and surveying
- Reintroduce native genetically pure populations
- Identify and remedy limiting factors

Management Plan

None

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Arctic Grayling (*Thymallus arcticus*)

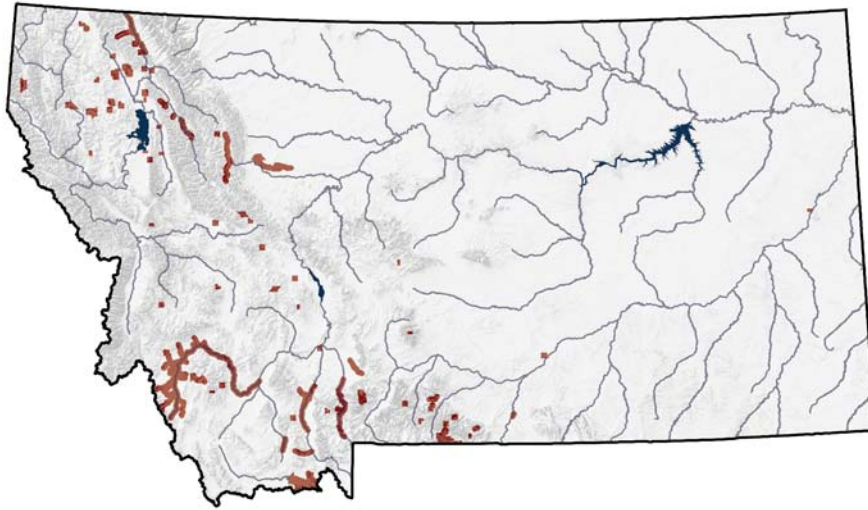


Figure 95. Distribution of the Arctic Grayling

Range

At the end of the 19th century, fluvial Arctic grayling were intermittently distributed throughout the upper Missouri drainage above Great Falls (Vincent 1962). During the 20th century, the range of fluvial Arctic grayling has been restricted to the Big Hole River of southwest Montana, about 4% of its native range (Kaya 1992a). Vincent (1962) attributed the decline of fluvial Arctic grayling throughout their native range to four factors: habitat degradation, introduction of non-native salmonids, climatic change, and exploitation by anglers.

Habitat

Occur in both ponds/lakes as well as riverine systems, however these differences make two distinct populations of either adfluvial or fluvial populations. Cool temperatures are needed to sustain populations as well as gravelly substrate needed for breeding purposes.

Management

The Fluvial Arctic Grayling Workgroup (FGW) developed a plan to research, protect, and restore fluvial Arctic grayling (FGW 1995). A primary objective was to develop a brood stock from wild Big Hole River Arctic grayling to preserve their genetic identity. Gametes were collected from spawning Arctic grayling in the Big Hole River between 1988 and 1992, until a sufficient founding population was represented (Leary 1991). Progeny of the brood stock with genetic diversity equivalent to the wild stock were available in 1995. Arctic grayling derived from

the brood may be used to augment the Big Hole River population, if necessary, and to reestablish other populations within their native range.

Another objective of FGW is to expand the range of fluvial grayling beyond the Big Hole River basin. Kaya (1992b) identified streams suitable for reintroductions of fluvial grayling. Experimental reintroductions have occurred in Cougar Creek, Yellowstone National Park, and in the West and East Gallatin rivers using progeny of the brood stock. Intensive reintroduction efforts are scheduled in 1997 for the Ruby River of southwestern Montana and the Firehole and Gibbons rivers in Yellowstone National Park in the near future.

Water quality and quantity problems are being addressed in the Big Hole basin. Efforts are underway to develop groundwater to supply livestock water while preserving minimum instream flows. Supplementation of instream flows through storage and water leasing has been investigated. Water conservation efforts in conjunction with water users were successful in preserving flows during severe drought in 1994.

A habitat inventory conducted in 1994 will provide baseline information necessary to identify degraded habitats and potential rehabilitation projects. Projects will be oriented toward riparian rehabilitation, decreasing peak water temperatures, and identifying and protecting critical habitats. While catch-and-release-only regulations protect grayling from over-harvest, angling regulations will also be used to exert pressure on non-native trout. More liberal regulations may inhibit encroachment of rainbow and brown trout into key grayling habitat.

Conservation Concerns

- Low flows during severe drought decrease survival of older Arctic grayling due to high water temperatures, increased susceptibility to predation, and diminished habitat volume
- Displacement by non-native rainbow and brook trout
- Arctic grayling are easily caught by anglers and are susceptible to over-harvest
- Degradation of riparian vegetation and stream banks by unsustainable grazing practices, mass willow removal, and dewatering the river for agricultural uses have negatively impacted fish habitat
- Blockage of fish passage by irrigation diversions

Conservation Strategies

- Support management of grazing to maintain riparian vegetation and streambank and channel stability in excellent condition
- Increased management of anglers
- Less stocking of non-native fish
- Decreased water runoff for irrigation purposes to increase stream volumes

Management Plans

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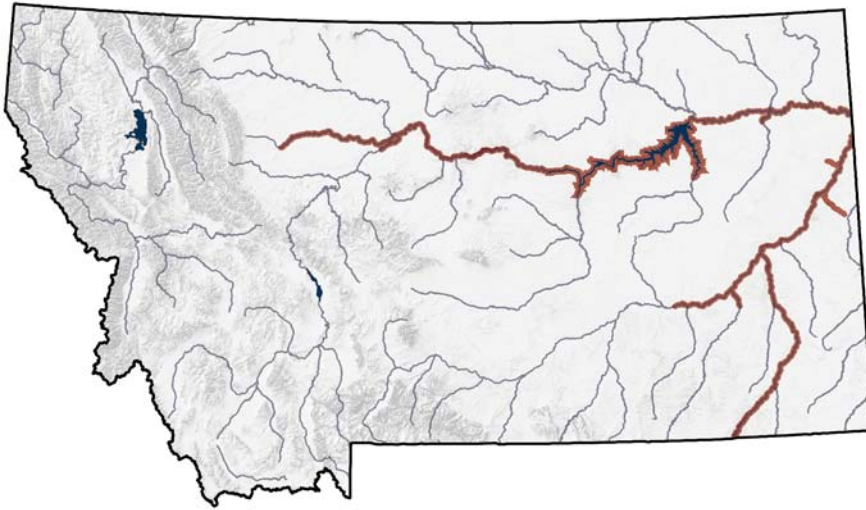
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12927 **Sturgeon Chub (*Hybopsis gelida*)**
 12928



12929
 12930 Figure 96. Distribution of the Sturgeon Chub
 12931

12932 **Range**
 12933

12934 The sturgeon chub is indigenous to the Missouri-Mississippi river basins from
 12935 Montana to Louisiana (Lee et al. 1980; Werdon 1993). Historically, sturgeon
 12936 chub have been collected in small numbers from only a few locations in Montana
 12937 so the Montana Department of Fish, Wildlife & Parks designated it a state
 12938 species of special concern over two decades ago (Holton 1980). More recently,
 12939 Werdon (1993) reported the sturgeon chub was in possible danger of extinction
 12940 over much of its former range, including all relevant Montana waters except the
 12941 Powder River. However, recent collections of this species show it is more
 12942 widespread and abundant than previously understood. Prior to 1975 only four
 12943 collections of sturgeon chub were known from Montana. The first collection was
 12944 taken from an unknown site on the Milk River (Girard 1856) and three collections
 12945 were reported over 100 years later from the Yellowstone River drainage (Bailey
 12946 and Allum 1962; Brown 1971). Collections from 1975-1982 determined that
 12947 chubs were also present throughout the Powder River (Rehwinkle 1978), in the
 12948 lower Tongue River (1980), in the lower Teton and the middle Missouri rivers
 12949 (Gardner and Berg 1982).

12950
 12951 During the Period 1990-95, collections have verified the persistence of sturgeon
 12952 chub in much of their previously known range and established major range
 12953 extensions. Sturgeon chub are still present in the Powder River (Werdon 1993;
 12954 Gould 1994), lower Yellowstone River (Werdon 1993; 1994 MSU collections by
 12955 Bramblett et al.) and mid-Missouri River (1994 MSU collections by Gardner and
 12956 Grisak). Furthermore, collections from 1993 - 1995 have yielded significant up and
 12957 down-stream range extensions in the lower Yellowstone (MSU collections by
 12958 Bramblett et al., Ruggles 1997 and Stewart 1994), mid-Missouri (MSU collections

by Gardner and Grisak) and the lower Missouri rivers (Tews 1993 and Ruggles 1997). In total, recent sturgeon chub have been found over some 650 km in three Montana rivers (Gould 1994). However, sampling has not been able to establish their continued existence in the lower Teton, Milk and Tongue rivers (Gould 1994).

Habitat

Sturgeon chub are highly adapted to life in turbid waters. They have small eyes and many external papillae on their bodies and fins, probably to aid in locating food (Cross 1967, Pflieger 1975). Chub are most closely associated with sites having moderate currents and depths and sand or rock substrates (Baxter and Simon 1970; Brown 1971; Lee et al. 1980). In the Powder River, sturgeon chub were taken most frequently at sites with depths less than 51 cm and depth velocities of less than 90 cm/s at 0.6 depth (Stewart 1981; Werdon 1992; Gould unpublished data).

Management

The management of this species should involve routine monitoring (once every 2-3 years) of existing populations. The program should be designed to monitor population trends, range expansion or losses and collect additional information on life history and ecology. This could be conducted while sampling for other species. Recommendations for operating reservoir and irrigation projects should be developed for improving and maintaining sturgeon chub populations and habitats in Montana. Reintroduction of sturgeon chub should be considered for the lower Teton, Milk and Tongue rivers.

Conservation Concerns

- Habitat alteration by dam operations, reducing turbidities and/or altering temperature and flow regimes
- Channelization of the Missouri river due to irrigation operations and development
- Decreased range and abundance of prey aquatic insect larvae due to dam construction and snag removal
- Removal of wild individuals used for bait fish
- Predation by non-native fish
- Low stream flows probably have eliminated some peripheral sturgeon chub populations in smaller streams

Conservation Strategies

- Consider preparing management plan for Sturgeon Chub or inclusion into other comprehensive taxonomic plan
- Support sustainable irrigation projects

- 13005 • Conservation practices on large rivers in Eastern Montana
- 13006 • Increased monitoring and survey efforts in Eastern Montana
- 13007 • Educate the public of necessity of native species
- 13008 • Repopulate smaller tributaries such as Teton, Milk and Tongue to
- 13009 establish periphery populations
- 13010

13011 **Management Plan**

13012

13013 None

13014

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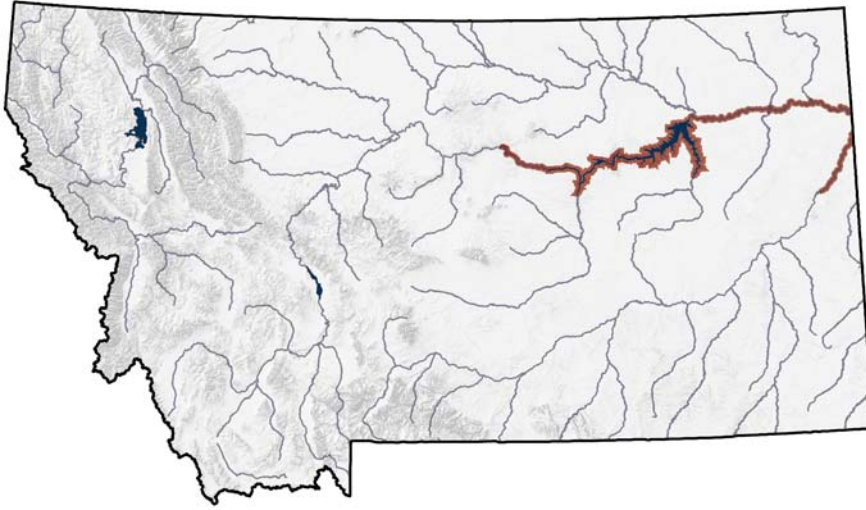
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13088
13089

13089 **Sicklefin Chub (*Hybopsis meeki*)**
 13090



13091
 13092 Figure 97. Distribution of the Sicklefin Chub
 13093

13094 **Range**
 13095

13096 The first observation of sicklefin chub in Montana was in 1979 in the middle
 13097 Missouri River upstream of Fort Peck Reservoir (Gould 1981 and Gardner and
 13098 Berg 1982). Until this time they were unknown to exist in the state most likely
 13099 because of the lack of sampling effort in eastern Montana. At present, the
 13100 distribution of sicklefin chub in Montana includes the middle Missouri River from
 13101 Cow Island downstream to the headwaters of Fort Peck Reservoir (Grisak 1996),
 13102 the lower Missouri River from the mouth of Redwater River to the Yellowstone
 13103 River confluence (Liebelt 1996), and in the lower Yellowstone River, from Intake
 13104 Diversion Dam to the confluence with the Missouri (Ruggles 1997). As of 1997,
 13105 the known range of sicklefin chub encompasses nearly 280 kilometers of river in
 13106 the Missouri and Yellowstone drainages.
 13107

13108
 13109 **Habitat**
 13110

13111 Spawning occurs in primary channel areas of large turbid rivers that they inhabit.
 13112 The spawning period is in the summer months and probably occurs over a wide
 13113 time span, similar to other big river species. Young of the year sicklefin chub
 13114 have never been collected and early life history remains a mystery. Although the
 13115 species has been sampled from shallow water and rocky substrate, there seems
 13116 to be a general preference for deeper water and sandy substrate. Unlike the
 13117 sturgeon chub, all of the Montana captures have been from only the Missouri and
 13118 Yellowstone rivers, indicating a strong preference for large turbid rivers.
 13119

13120 **Management**

The management of this species should involve routine monitoring (once every 2-3 years) of existing populations. The program should be designed to monitor population trends, range expansion or losses and collect additional information on life history and ecology. This could be conducted while sampling for other species. The lack of proper monitoring of these populations could lead to their demise by virtue of not recognizing if and when they are in jeopardy of becoming extirpated by any artificial or natural entity. Recommendations for operating reservoir and irrigation projects should be developed for improving and maintaining sicklefin chub populations and habitats in Montana.

Conservation Concerns

- Habitat alteration by dam operations, reducing turbidities and/or altering temperature and flow regimes
- Channelization of the Missouri river due to irrigation operations and development
- Decreased range and abundance of prey aquatic insect larvae due to dam construction and snag removal
- Removal of wild individuals used for bait fish
- Predation by non-native fish

Conservation Strategies

- Consider preparing management plan for Sicklefin Chub or inclusion into other comprehensive taxonomic plan
- Support sustainable irrigation practices
- Conservation practices on large rivers in Eastern Montana
- Increased monitoring and survey efforts in Eastern Montana
- Educate the public of necessity of native species

Management Plan

None

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13192

Pearl Dace (*Margariscus margarita*)

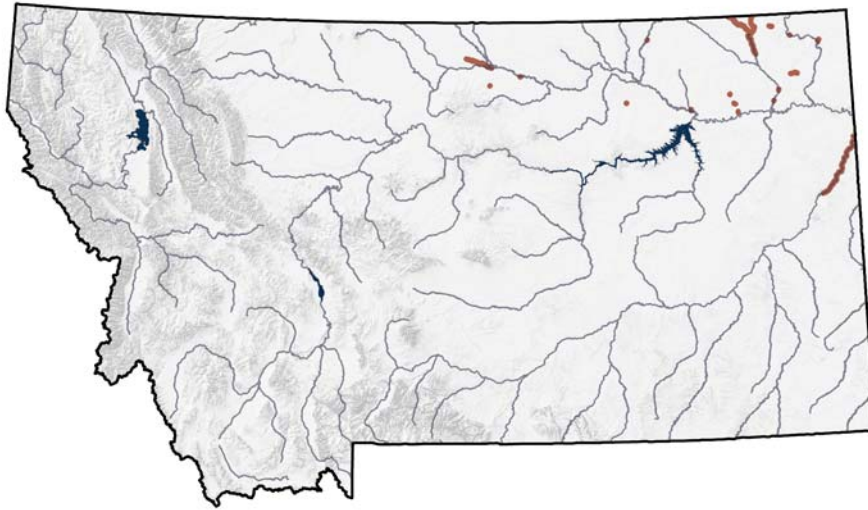


Figure 98. Distribution of the Pearl Dace

Range

Montana contains the southwestern periphery of the continental range of the pearl dace. In Montana, pearl dace occur only in the Missouri and Saskatchewan River basins. Most known pearl dace localities are in south-flowing tributaries to the Missouri River downstream of the confluence of the Milk River, in the Milk River drainage, or on the Blackfeet Indian Reservation in Glacier County and in Glacier National Park (Schultz 1941; Gould and Brown 1968; Brown 1971; Holton and Johnson 2003; Stash 2001; Bramblett, unpublished data; Robbin Wagner, U. S. Fish and Wildlife Service, personal communication, January 2004).

Two previously reported localities for pearl dace in the lower Yellowstone River (Gould and Brown 1968; Brown 1971; Holton and Johnson 2003) were probably attributable to misidentified creek chubs. The Gould and Brown (1968) collection was reexamined and the putative pearl dace was found to be a creek chub (William R. Gould, Montana State University, personal communication, January 2004). Other surveys have failed to find pearl dace in the Yellowstone River basin in Montana (Elser et al. 1980; Bramblett, unpublished data). Pearl dace appear to be a glacial relict in Montana as they are most commonly found in formerly glaciated portions of the plains regions.

Habitat

Pearl dace occur in lakes, cool bog ponds, creeks, and cool springs (Scott and Crossman 1973). Little habitat-related information exists for this species in Montana. At four stream locations where pearl dace were captured in

northeastern Montana, average stream widths ranged from 5.4 to 11.8 m, average thalweg depths ranged from 0.4 to 1.4 m, substrates ranged from 53 to 100 % fine substrate (< 0.06 mm), and aquatic macrophytes were sparse to very heavy (<10 % to >75 % coverage; Bramblett, unpublished data). Eleven fish species were associated with pearl dace in seven collections from four sites on four Montana streams.

Pearl dace appear to prefer cool to coldwater temperatures. In Canada, pearl dace were more often found to co-occur with brook trout (*Salvelinus fontinalis*) and mottled sculpin (*Cottus bairdi*) at water temperatures of 15.8 to 16.6° C, than with smallmouth bass (*Micropterus dolomieu*) and rock bass (*Ambloplites rupestris*) at 20.8 to 21.5° C (Becker 1983). The upper lethal temperature for pearl dace was found to be 31.1° C (Becker 1983). In the southernmost part of their range in Maryland and Virginia, pearl dace were found in streams that were cool in summer and warm in winter, with substantial spring-water input (Tsai and Fava 1982). In Montana, pearl dace were captured in streams with daytime water temperatures in July-September ranging from 9.6 to 23.1° C (Bramblett, unpublished data).

Management

Montana Fish, Wildlife & Parks classify the pearl dace as a species of special concern. The primary management task is to monitor the status of the species in Montana. Fish surveys supported by voucher specimens should be conducted in streams across the range of the species to better determine its geographic range. Streams with historical collection records should be sampled to determine if the species is still extant there. Further introductions or expansions of the ranges of introduced piscivores, especially northern pike, should be discouraged.

Conservation Concerns

- Limited distribution in Montana renders it vulnerable to extirpation from the state
- Populations vulnerable to predation and competition
- Collected by anglers seeking bait minnows
- Anthropogenic stressors that increase water temperatures

Conservation Strategies

- Consider preparing management plan for Pearl Dace or inclusion into other comprehensive taxonomic plan
- Reduce introduction of non-native species into river systems
- Conservation of prairie streams to include less livestock use, increase riparian quality, decrease fertilizers and nutrients used
- Educate anglers of importance of native fish

- Reduce stocking of non-native fish which may compete or prey on this species

Management Plan

None

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Blue Sucker (*Cycleptus elongates*)

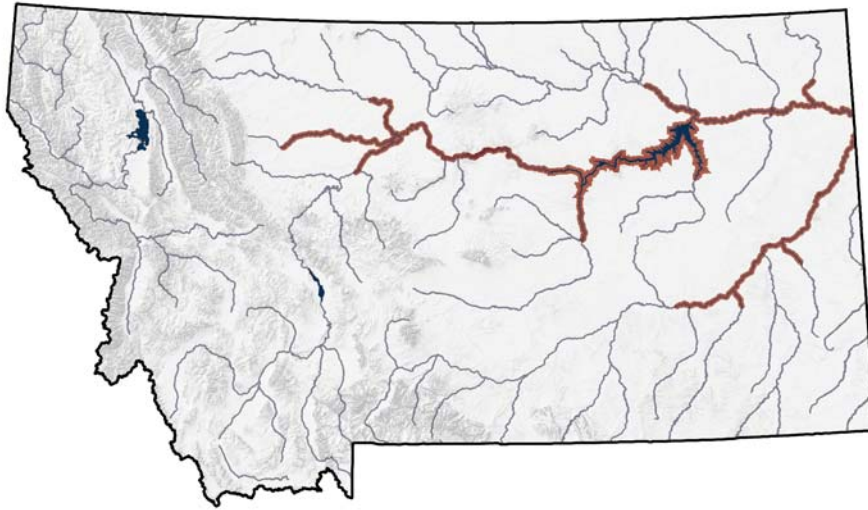


Figure 99. Distribution of the Blue Sucker

Range

In Montana, blue suckers are found in the Missouri River as far upriver as Morony Dam near Great Falls, and in the Yellowstone River upriver of Forsyth, Montana. Blue suckers have been found in many of the major tributary streams during their spawning season. There have been very few blue suckers sampled in Fort Peck Reservoir, indicating their avoidance of lake environments (AFS website 2003).

Habitat

The blue sucker is adapted for life in swift current areas with low turbidity. This fish prefers swift current areas of large rivers, feeding on insects in cobble areas (Moss et al. 1983). In the spring blue suckers migrate upriver and congregate in fast rocky areas to spawn. Large numbers have been observed migrating up tributary streams to spawn. The Tongue, Marias, Milk and Teton rivers are the tributary streams most heavily used.

Management

Management of the blue sucker consists primarily of routine monitoring of population status and habitat protection. The blue sucker is considered an indicator species for ecotype health because of its habitat-specific requirements. Current monitoring information indicates the populations are in stable condition. Efforts towards locating spawning and rearing areas should be continued. Habitat protection includes protecting or promoting the natural springtime hydrograph. Establishment of more natural seasonal flow conditions is presently being

discussed and initiated for three storage reservoirs in Montana (AFS website 2003).

Conservation Concerns

- Habitat changes caused by large dams that block passage to spawning grounds, alter streamflow, and eliminate peak flows that initiate spawning runs. Dams also discharge cold, clear water as opposed to the warm, turbid waters in which these species evolved
- Fragmentation of habitat due to impoundments
- Channelization of large lotic systems
- Changes in riparian habitat, less regeneration of woody trees and understory

Conservation Strategies

- Consider preparing management plan for Blue Sucker or inclusion into other comprehensive taxonomic plan
- Continue conservation of habitats by managing grazing in riparian areas
- Regulate water regimes to be more closely tied to natural water regimes
- Create “fish wheels” so suckers can move upstream of river impoundments

Management Plan

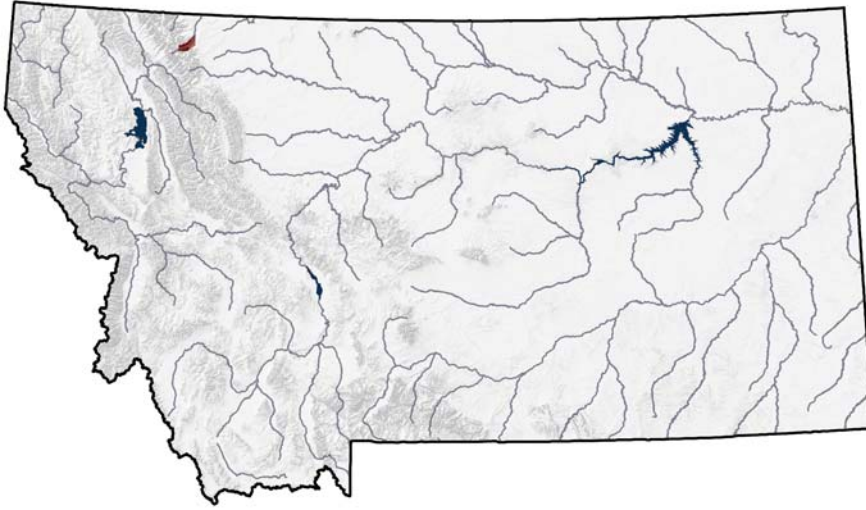
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13390 **Trout-perch (*Percopsis omiscomaycus*)**
 13391



13392
 13393 Figure 100. Distribution of the Trout-perch
 13394

13395 **Range**
 13396

13397 In Montana, the trout-perch occurs in the South Saskatchewan River basin,
 13398 which drains northeastern Glacier National Park and the northwestern portion of
 13399 the Blackfeet Indian Reservation. Trout-perch were not reported in Montana until
 13400 1968 (Gould 1969), and the only Montana collection records are from Lower St.
 13401 Mary Lake (Gould 1969; Brown 1971) and the associated St. Mary canal (Holton
 13402 and Johnson 1996). Trout-perch have not been reported in other areas of the
 13403 South Saskatchewan River basin in Montana, such as the Belly River and
 13404 Waterton Lake, but they may occur there, as this basin has not been surveyed
 13405 extensively (Brown 1971; L. Marnell, National Park Service, personal
 13406 communication, October 2000). Moreover, trout-perch are commonly collected in
 13407 the Belly River and Waterton Lake systems in Alberta (T. Clayton, Alberta
 13408 Environment, unpublished data, January 2001). Trout-perch have also been
 13409 captured in the Milk River in Alberta (T. Clayton, Alberta Environment,
 13410 unpublished data, January 2001). The Milk River basin is outside of the trout-
 13411 perch's native range. Trout-perch apparently gained access to the Milk River
 13412 basin via the St. Mary Canal, which connects the St. Mary River system with the
 13413 North Fork Milk River.

13414
 13415 **Habitat**
 13416

13417 In Montana, trout-perch are regularly captured in Lower Saint Mary Lake and the
 13418 Saint Mary Canal using backpack and boat electrofishing (R. Wagner, U.S. Fish
 13419 and Wildlife Service, personal communication, October 2000). In the lake, they
 13420 are associated with large rocky cover, and are not captured over sandy or silty
 13421 substrates. During daylight periods they appear to use rocks as hiding cover,

while at night they are out of, but in close proximity, to rocky cover. In the Saint Mary Canal, trout-perch have been captured in winter after the canal head gate is closed. In the canal, trout-perch are found in residual pools associated with large, rocky cover or concrete riprap (R. Wagner, U.S. Fish and Wildlife Service, personal communication, October 2000). Scott and Crossman (1973) report that trout-perch are typically a lake species in eastern Canada, but that it also occurs in streams, including somewhat turbid streams, in western Canada. Trout-perch are reported to undergo diel migrations into shallower inshore waters of lakes at night (Brown 1971; Eddy and Underhill 1974; Becker 1983; Nelson and Paetz 1992).

Management

Montana Fish, Wildlife & Parks classify trout-perch as a nongame wildlife species. They are too small to be sought by anglers. The entire known range of trout-perch in Montana is within Glacier National Park and the Blackfeet Indian Reservation. Neither entity has a specific management program for trout-perch.

Conservation Concerns

- Sensitive to pollution and sedimentation associated with row crop agriculture, as well as channelization
- Sensitive to warm water temperatures
- Impoundments restricting proper movement of populations

Conservation Strategies

- Consider preparing management plan for Trout-perch or inclusion into other comprehensive taxonomic plan
- Surveys in the Belly River and Waterton Lake in Montana are needed to establish the presence of trout-perch in these waters
- Conservation of riparian areas, including increased restrictions of fertilizers and nutrients seeped into waters
- Manage irrigation and development to improve connectivity of habitat

Management Plan

None

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Burbot (*Lota lota*)

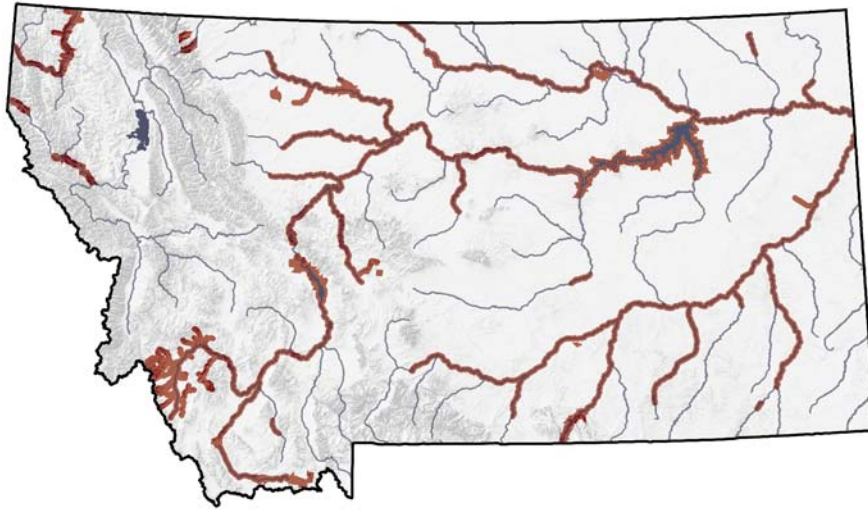


Figure 101. Distribution of the Burbot

Range

Burbot are found in all three major river drainages in Montana. Burbot, also known as ling, are usually found in larger streams and cold, deep lakes and reservoirs.

Habitat

Burbot habitat includes large rivers and cold, deep lakes and reservoirs. In lakes, they are mostly associated with bedrock and rubble substrates (Edsall et al. 1993). If soft substrates are present, burbot may construct burrows (Boyer et al. 1989). River requirements are less understood, but some believe they were originally restricted to backwater areas of cooler high-altitude systems (McPhail and Paragamian 2000). Their long cylindrical shape and poor swimming ability prevents them from inhabiting high current areas (Jones et al. 1974). Most spawning is believed to occur in lakes (Scott and Crossman 1973; McPhail and Paragamian 2000); however, reproduction may also occur in rivers and streams (Cahn 1936; Arndt and Hutchinson 2000; Paragamian 2000). They spawn in shallow water, usually in rocky areas.

Management

Presently, burbot management is poorly understood or non-existent (McPhail and Paragamian 2000). To implement any management strategies designed at maintaining or enhancing burbot populations in Montana, we must know more information regarding basic population characteristics (e.g., population sizes, age structure, and condition). Little effort has been made to sample specifically for

burbot and assess their population status in Montana waters. Sampling has been impeded by the relative inactivity of burbot during common sampling periods. Thus, basic population characteristic data (e.g., size structure, age structure, mortality, size at maturity) is lacking throughout the state. The burbot population in the Kootenai River below Kootenai Falls is declining and because of this, it has been petitioned for listing as a federally endangered species. The decline in this population has been attributed to the operation of Libby Dam for hydroelectric power flood control. Similar declines in burbot populations have been seen in other states following dam construction.

Conservation Concerns

- Overfishing
- Poorly understood life history traits and habitat requirements
- Reduced numbers in river systems due to impoundments

Conservation Strategies

- Evaluate angler exploitation rates and determine sustainability of wild populations
- Increased surveys to gain knowledge
- Work with managing authorities to encourage reservoir management to mimic natural hydrograph

Management Plan

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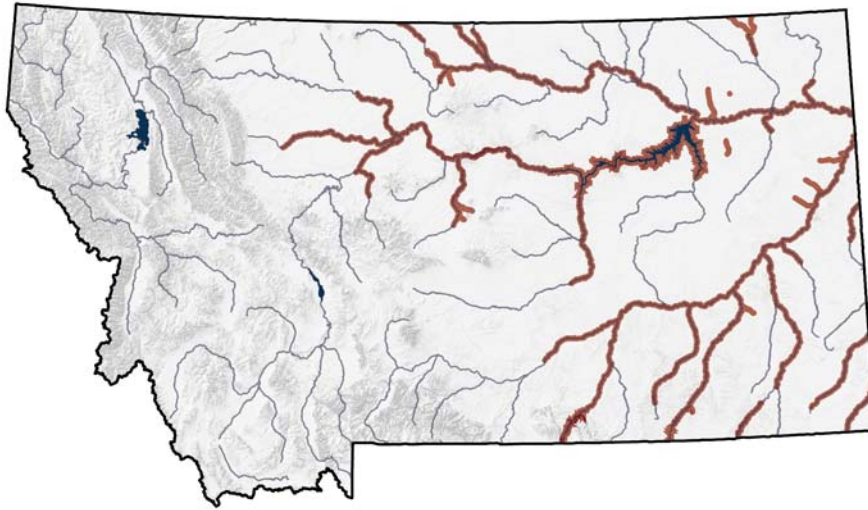
Sauger (*Sander canadensis*)

Figure 102. Distribution of the Sauger

Range

Sauger are one of the most widely distributed North American fishes with a historical range extending across most of central and eastern North America from the St. Lawrence-Champlain system south, west of the Appalachian Mountains, to the Tennessee River in Alabama, and northwestward to central Montana and Alberta (Scott and Crossman 1973).

In Montana, historical distribution included the Missouri River and its major tributaries downstream of Great Falls and the Yellowstone River and its major tributaries downstream of the Clark Fork (McMahon and Gardner 2001). Current distribution in Montana has declined by 53% from historical levels with the largest losses occurring in tributaries (McMahon and Gardner 2001). Current distribution in the Missouri River drainage is confined to the primarysystem Missouri and small parts of the previously widely occupied Marias, Musselshell, and Milk rivers (McMahon and Gardner 2001). Sauger are considered rare or absent in other major tributaries such as the Teton, Judith, and Poplar rivers (McMahon and Gardner 2001). In the primarysystem Yellowstone River, distribution is now considered limited to downstream of Rosebud Creek; sauger are considered rare or absent in major tributaries such as the Big Horn and Tongue Rivers although a small, partially isolated population may persist in the upper Powder River (McMahon and Gardner 2001; B. Stewart, Wyoming Department of Game and Fish, Sheridan, WY, personal communication).

Habitat

Sauger typically occurs in large turbid rivers and shallow turbid lakes (Becker 1983). Turbidity is an important delineator of suitable habitat for sauger. Physiological adaptations, such as a highly advanced light-gathering retina, allow sauger to thrive in low-light environments (Ali and Anctil 1977; Crance 1987). As cool water mesotherms, sauger have a fairly wide range of thermal tolerance with occupied temperatures ranging from 1 to 30 C and a physiological optimum of 18 to 24 C (Crance 1987; Carlander 1997).

Sauger are heavily dependent throughout their life history on unimpeded access to the wide diversity of physical habitats that are present in large river systems. They are considered to be the most migratory percid (Collette 1977). Their migratory behavior, which is primarily related to spawning, is well documented throughout their range with annual movements of up to 600 km between spawning and rearing habitats (Nelson 1968; Collette et al. 1977; Penkal 1992; Pegg et al. 1997; M. E. Jaeger, Montana State University, unpublished data). Sauger are highly selective for spawning sites and commonly travel long distances to aggregate in a relatively few discrete areas to spawn (Nelson 1968; Nelson 1969; Gardner and Stewart 1987; Penkal 1992). Although primarystem spawning does occur (Jeager 2004), it has been suggested that sauger populations are strongly reliant on access to large tributaries for spawning (Nelson 1968; Gardner and Stewart 1987; Penkal 1992; Hesse 1994; McMahon 1999). Spawning locations are associated with unique geomorphic features, such as bluff pools and bedrock reefs, and rocky substrates over which sauger broadcast their eggs (Nelson 1968; Gardner and Stewart 1987; Hesse 1994; Jeager 2004). During a 10-12 day period following emergence, its thought that larval sauger drift long distances downstream--up to 300 kilometers--prior to gaining the ability to maneuver horizontally and begin feeding (Nelson 1968; Penkal 1992; McMahon 1999). Juveniles rear in side channels, backwaters, oxbows, and other off-channel habitats during spring and summer before shifting to primary channel habitats in autumn (Gardner and Berg 1980; Gardner and Stewart 1987; Hesse 1994). Adult sauger also use off-channel and channel-margin habitats during the spring and early summer periods of high flow and turbidity, and then move to deeper primary channel habitats in late summer and autumn as decreasing flows and turbidities cause suitable off-channel habitats to become unavailable (Hesse 1994; M. E. Jaeger 2004).

Management

Mitigation of habitat loss and fragmentation holds the most potential for recovery of this species. Removal of primarystem and tributary impoundments, which would restore natural flow and sediment regimes, natural channel and habitat formation processes, and population and habitat connectivity, would be the single most effective restorative action that could be taken and holds far and away the greatest potential for recovery of sauger and other imperiled large river fishes in

Montana. Although such restorative measures are unlikely at this time, other restoration potential does exist and is being pursued. Improved passage at several irrigation-related migratory barriers is being planned and implemented. Similarly, fish screens and return structures have been installed and more are planned to minimize entrainment of fish in irrigation canals. Negotiations to restore instream flows in some tributaries, especially during critical spring spawning times, are ongoing. Flow releases from primarysystem dams can also be regulated throughout the year to maximize spawning success and year-class strength of sauger (Nelson 1968; Walburg 1972). Angler harvest has been restricted to reduce fishing mortality in areas where declines in sauger abundances are most marked. Supplementation of sauger populations by artificial propagation is being attempted to bolster abundances and restore sauger to areas where they have been extirpated. Levels of introgression with walleye are being investigated to determine the threat to sauger as walleye populations expand. Additionally, extant sauger populations are being closely monitored and research is being conducted to fill information gaps to allow managers to determine how and where restoration and conservation efforts can be most effectively directed.

Conservation of what habitat remains should also be recognized as essential to the recovery and restoration of sauger in Montana. Montana boasts some of the most pristine large-river habitat in the United States. Preservation of natural hydrographs, natural processes of channel formation, and high degrees of connectivity where they currently exist should be considered among the highest priorities for sauger conservation and recovery. Preservation of existing habitat can best occur by minimizing the diversion of water from river channels and limiting processes such as channelization and stream-bank armoring that result in loss of important off-channel habitats. Additionally, it is important that further disruptions to the connectivity of tributary and primarysystem habitats be prevented to avoid further declines in abundance and distribution of sauger in Montana.

Conservation Concerns

- Water withdraws resulting in low river flows
- Reservoir operation that alters the natural hydrograph
- Barriers that negatively influence spawning movement patterns and larval drift
- Channelization and loss of side channel habitat for larval and juvenile sauger
- Hybridization with walleye
- Negative interactions with other species such as walleye and smallmouth bass
- Overexploitation

Conservation Strategies

- Removal of primarystem and tributary impoundments
- Improved passage at several irrigation-related migratory barriers
- Flow releases from primarystem dams can also be regulated throughout the year to maximize spawning success and year-class strength of sauger
- Minimizing the diversion of water from river channels and limiting processes such as channelization and stream-bank armoring that result in loss of important off-channel habitats

Management Plan

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Component IV: Greatest Inventory Needs

“Over time, this strategy will allow us to collect data for 1) for species we do not have sufficient information to determine their level of conservation need, 2) species that are important or indicator species for health of certain communities, or 3) species we think can help us measure the success we are having at conserving our fish and wildlife using a comprehensive approach”

Prior to assessing inventory needs, we obtained and entered 130,000 additional observation points to the POD maintained by the Montana Natural Heritage Program. However, many species still have inadequate amounts of data, poor quality data, or the information is outdated. Without adequate occurrence data it is difficult to determine the abundance or distribution of the species, making it impossible to confidently classify the need for conservation of a species and the habitats that sustain them. Likewise, many species and groups of species that might have adequate observations offer unique opportunities to gauge the health of other fish and wildlife as well as habitats through ongoing monitoring. We define inventory as collecting data in order to establish the occurrence and distribution of species, but we also recognized that collecting data in order to establish population trends of species statewide over time is important and could occur coincidentally with inventory efforts. Future versions of this Strategy should consider developing separate species monitoring and species research components that assign species and species groups to Tiers based on specific need for trend monitoring or research.

The following species and groups of species were identified as Tier I (in greatest need of inventory). This Tier assignment is separate from the species component Tier assignments provided earlier in this Strategy. In other words the Species assigned Tier I for this inventory component were assessed regardless if the species has a population considered low or declining. Ongoing inventory for the following groups should continue and coordinated efforts should be made to inventory these groups and species. The following legend can be used to provide information about why a group or species has been classified as Tier I, and can also be used to frame experimental design. All species and group inventory Tier assignments can be found in Tables 8 and 9.

Legend for Groups & Species in Greatest Inventory Needs:

Inventory:

I¹ :Observational data are lacking

I² :Observational data are outdated

I³ :Observational data are of poor quality

I⁴ :Statewide inventory needed

I⁵ :Localized inventory needed

- 13843 I⁶ :Group/Species require targeted survey efforts
 13844 I⁷ :Information required to know is species a migratory or peripheral species
 13845 I^M :Monitoring efforts required

13846

13847 **Other:**

13848

13849 O¹ :Dependant on critical habitats

13850 O² :Opportunity exists for Law Enforcement to assist with inventory

13851

13852 **Groups with Greatest Inventory Needs**

13853

13854 Birds, owls group I¹, I⁴, I⁶, O¹

13855 Birds, shorebirds/waterbirds group I¹, I⁴, I⁶, O¹

13856 Fish-Prairie group I¹, I⁴, I⁶

13857 Mammals, bats group I¹, I⁴, I⁶

13858 Mammals, small group I¹, I⁴, I⁶

13859 Reptiles group I¹, I⁴, I⁶

13860 Crayfish Group I¹, I⁴, I⁶

13861 Mussels group I¹, I⁴, I⁶

13862 Invertebrate Group I¹, I⁴, I⁶

13863

13864 **Species with Greatest Inventory Needs**

13865

13866 American Bittern I¹, I⁴, O¹

13867 Black-crowned Night-heron I¹, I⁴, O¹

13868 White-faced Ibis I¹, I⁴, O¹

13869 Northern Goshawk I¹, I⁶, I^M

13870 Columbia Sharp-tailed Grouse I¹, I⁶, I^M

13871 Yellow Rail I¹, I⁴, I⁷

13872 Greater Yellowlegs I¹, I⁴, I⁷

13873 Solitary Sandpiper I¹, I⁴, I⁷

13874 Semipalmated Sandpiper I¹, I⁴, I⁷

13875 Western Sandpiper I¹, I⁴, I⁷

13876 Least Sandpiper I¹, I⁴, I⁷

13877 Baird's Sandpiper I¹, I⁴, I⁷

13878 Pectoral Sandpiper I¹, I⁴, I⁷

13879 Dunlin I¹, I⁴, I⁷

13880 Long-billed Dowitcher I¹, I⁴, I⁷

13881 Arctic Tern I¹, I⁴, I⁷

13882 Black-billed Cuckoo I¹, I⁴, O¹

13883 Yellow-billed Cuckoo I¹, I⁴, I⁷, O¹

13884 Barn Owl I¹, I⁴, I⁷, O¹

13885 Northern Hawk Owl I¹, I⁴, I⁶

13886 Common Nighthawk I¹, I⁴, I⁶, I^M

13887 Common Poorwill I¹, I⁴, I⁶, I^M

13888 Black Swift I¹, I⁵, I⁶, I^M, O¹

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13889	Chimney Swift	I ¹ , I ⁴ , I ⁶ , O ¹
13890	White-throated Swift	I ¹ , I ⁴ , I ⁶ , I ⁷ , I ^M
13891	Black-chinned Hummingbird	I ¹ , I ⁴ , O ¹
13892	Alder Flycatcher	I ¹ , I ⁴ , I ⁶ , I ^M
13893	Purple Martin	I ¹ , I ⁴ , I ⁶ , I ⁷
13894	Canyon Wren	I ¹ , I ⁴ , I ⁶ , I ^M , O ¹
13895	Sedge Wren	I ¹ , I ⁴ , I ⁷
13896	American Dipper	I ¹ , I ² , I ⁴ , I ⁶ , I ^M
13897	Blue-gray Gnatcatcher	I ¹ , I ⁵ , I ⁶ , I ⁷
13898	Eastern Bluebird	I ¹ , I ⁴ , I ⁷
13899	Western Bluebird	I ¹ , I ⁴ , I ⁶ , I ^M
13900	Black-and-white Warbler	I ¹ , I ⁴ , I ⁶ , I ^M , O ¹
13901	Indigo Bunting	I ¹ , I ⁴ , I ⁶ , I ^M , O ¹
13902	Green-tailed Towhee	I ¹ , I ⁴ , I ⁶ , I ^M , O ¹
13903	Field Sparrow	I ¹ , I ⁵ , I ⁶ , I ⁷ , I ^M
13904	Le Conte's Sparrow	I ¹ , I ⁴ , I ⁷
13905	Nelson's Sharp-tailed Sparrow	I ¹ , I ⁴ , I ⁷
13906	Black Rosy-finch	I ¹ , I ⁴ , I ⁷
13907	Torrent Sculpin	I ¹ , I ⁴
13908	Spoonhead Sculpin	I ¹ , I ⁴
13909	Shortnose Gar	I ¹ , I ⁵
13910	Lake Trout (native lakes)	I ¹ , I ⁶ , I ^M , O ²
13911	Western Silvery Minnow	I ¹ , I ⁴ , I ⁶ , I ^M
13912	Brassy Minnow	I ¹ , I ⁴ , I ⁶ , I ^M
13913	Plains Minnow	I ¹ , I ⁴ , I ⁶ , I ^M
13914	Pearl Dace	I ¹ , I ⁴
13915	Trout-perch	I ¹ , I ⁴
13916	Iowa Darter	I ¹ , I ⁴
13917	Arctic Shrew	I ¹ , I ⁵ , I ⁷
13918	Northern Myotis	I ¹ , I ⁴ , I ⁷
13919	Eastern Red Bat	I ¹ , I ⁴ , I ⁷
13920	Spotted Bat	I ¹ , I ⁴ , I ⁶ , I ^M
13921	Townsend's Big-eared Bat	I ¹ , I ⁴ , I ⁶ , I ^M , O ¹
13922	Pallid Bat	I ¹ , I ⁴ , I ⁷
13923	American Pika	I ¹ , I ⁴ , I ⁶ , I ^M , O ¹
13924	Eastern Cottontail	I ¹ , I ⁴ , I ⁷
13925	Black-tailed Jackrabbit	I ¹ , I ⁵ , I ⁶ , I ^M
13926	Uinta Chipmunk	I ¹ , I ⁵ , I ⁶
13927	Hoary Marmot	I ¹ , I ⁵ , I ⁶ , I ^M , O ¹
13928	Uinta Ground Squirrel	I ¹ , I ⁵ , I ⁶ , I ^M
13929	Wyoming Ground Squirrel	I ¹ , I ⁵ , I ⁶ , I ^M
13930	Northern Flying Squirrel	I ¹ , I ⁵ , I ⁶ , I ^M
13931	Idaho Pocket Gopher	I ¹ , I ⁵ , I ⁶ , I ^M
13932	Hispid Pocket Mouse	I ¹ , I ⁵ , I ⁷
13933	Water Vole	I ¹ , I ⁴ , I ⁶ , I ^M
13934	Sagebrush Vole	I ¹ , I ⁴ , I ⁶ , I ^M

13935	Northern Bog Lemming	I ¹ , I ⁵ , I ⁶ , I ^M , O ¹
13936	Meadow Jumping Mouse	I ¹ , I ⁴ , I ⁶ , I ^M
13937	Common Porcupine	I ¹ , I ² , I ⁴ , I ⁶ , I ^M , O ²
13938	Western Spotted Skunk	I ¹ , I ⁴ , I ⁷ , O ¹ , O ²
13939	Snapping Turtle	I ¹ , I ⁴ , I ⁶ , I ^M
13940	Spiny Softshell	I ¹ , I ⁴ , I ⁶ , I ^M
13941	Northern Alligator Lizard	I ¹ , I ⁴ , I ⁶ , I ^M
13942	Western Skink	I ¹ , I ⁴ , I ⁶ , I ^M
13943	Rubber Boa	I ¹ , I ⁴ , I ⁶ , I ^M
13944	Western Hognose Snake	I ¹ , I ⁴ , I ⁶ , I ^M
13945	Milk Snake	I ¹ , I ⁴ , I ⁶ , I ^M , O ¹
13946	Smooth Green Snake	I ¹ , I ⁵ , I ⁶ , I ⁷
13947	Calico Crayfish	I ¹ , I ⁴ , I ⁶ , I ^M
13948	Virile Crayfish	I ¹ , I ⁴ , I ⁶ , I ^M
13949	A Crayfish	I ¹ , I ⁴ , I ⁶ , I ^M
13950	Signal Crayfish	I ¹ , I ⁴ , I ⁶ , I ^M
13951	Black Sandshell	I ¹ , I ⁴
13952	Western Pearlshell	I ¹ , I ⁴
13953		

Revision and Monitoring of the Strategy

The scope of this Strategy exceeds the funding provided through the State Wildlife Grants (SWG) that would be necessary to fully implement the conservation strategies identified in each of the four components. As of 2005, SWG funding is authorized on an annual basis and the amount can vary from year to year. The unstable nature of this funding will continue to serve as a roadblock that could prevent FWP and its partners from committing to long-term conservation projects. Due to these factors, caution should be used when attempting to apply performance measures to any of the components of this plan. At current levels and time intervals of SWG funding, the Inventory and Monitoring component of the Strategy is the most likely to be more completely implemented and therefore, provide more adequate results that can be for monitored through performance measures.

The Montana Comprehensive Fish and Wildlife Conservation Strategy is intended to be dynamic and the potential exists to review and revise priorities and monitor success within two of the four components (species and inventory) at short term intervals. Although this would not always be necessary, it is mentioned to demonstrate the degree to which these two components are connected and automated. The remaining two components (focus areas and community types) are linked as well, however, performance measures of landscape or community level health and conservation success are more difficult to parameterize and measure. Adequate information does not exist to establish a statewide baseline of landcover types or habitat conditions that contain consistent estimates of precision. For example, classified sagebrush land cover types in the existing database have a relatively low confidence interval attached

to them. Likewise, true community structures have not necessarily been established and validated for Montana's fish and wildlife and their related habitats and geo-climatic factors. The necessary land covers and community type structures will need to be developed and refined between the beginning of Strategy implementation and the next review cycle.

Because the components range from broad to fine-scale, the time needed to detect the success of implementation may vary from years to decades. As such, we will revise and monitor conservation success for each of the four components at different intervals. Although components will be monitored separately, the overall Strategy will be revised every six years. The following is the general timetable for monitoring and revision.

Component	Monitoring (FWP Information Management Unit)	Revision (FWP Responsive Management Unit)
Focus Areas	Every 6 years	Every 6 Years
Community Types	Every 6 years	Every 6 Years
Species	Annually	Every 6 Years
Inventory	Annually	Every 6 Years

Conservation Focus Areas

Conservation Focus Areas were identified that provide some of the greatest opportunities to conserve the community types and species in greatest need of conservation. The long-term success at conserving these areas can be measured by measuring the health of the communities and species that are associated with these areas. In most cases these long-term successes will require decades to detect. In the absence of other means, progress toward implementing the conservation strategies described for each Focus Area will be used as the performance measure for this component. Implementation will be measured as not implemented, partially implemented, fully implemented, or ongoing indefinite implementation needed. In the future, if adequate land cover layers are developed, and communities are defined, methods for monitoring the health and status of the communities and species within focus areas could be refined. The FWP Responsive Management Unit will coordinate the revision of this component in coordination with the Information Management Unit and FWP fish and wildlife staff every six years in collaboration with our partners and with public review.

Community Types

Fish and wildlife communities have not been defined in Montana. Although much of the information contained in this Strategy is not new, the Strategy planning process provided an opportunity to begin developing general and essential associations for all fish and wildlife species with their habitats by building on

many years research and work. We linked fish and wildlife with plants and geoclimatic characteristics to attempt and create community types. In the future, much research is needed to fully develop and validate true fish and wildlife communities in Montana. Success at conserving these communities could then be measured by using an index of overall community conditions. Success at conserving communities will require long term conservation efforts and success will most likely be detected on the scale of decades versus years.

In the absence of validated communities for Montana, progress toward implementing the conservation strategies described for each Community Type will be used as the performance measure for this component. Implementation will be measured as not implemented, partially implemented, fully implemented, or ongoing indefinite implementation needed. Once validated communities have been defined for Montana, monitoring the health and status of the communities will provide measures of success for implemented conservation strategies. The FWP Responsive Management Unit will coordinate the revision of this component in coordination with the Information Management Unit and FWP fish and wildlife staff every six years in collaboration with our partners and with public review.

Species

The FWP Information Management Unit will monitor success of implementing the species component of the Strategy annually. The Montana Animal Species of Concern List cooperatively maintained by FWP and NHP will be used as a performance measure for this component. Each year the NHP Senior Zoologist and the Chief of the FWP Information Unit will conduct a review of the list using a protocol developed by NaturServe and modified by Montana. The review combines the quantitative documentation approach from NaturServe with professional knowledge of staff from numerous agencies and organizations to determine species status. Subsequent to the annual review, the FWP Information Management Unit will use information from the updated Species of Concern list to re-calculate the assignment of level of conservation need to all Montana fish and wildlife species as described in the species methods section of this Strategy. Changes in Tier assignment will be used to help gauge if species are being successfully conserved in Montana. Overall, any species that moves from a higher Tier to a lower Tier (for example Tier I to Tier II), or off the list entirely, will be noted as a positive. Species that move from a being lower Tier to a higher Tier will be identified as a “matter of concern”.*

*Note: Upward movement of species in Tier assignment should not be considered a conservation failure. If inventory needs are successfully addressed awareness will be raised of the imperiled status of some species that were previously not known due to inadequate observational or monitoring data. Likewise prudent judgment should be used when considering a downward movement of species in Tier assignment as a conservation success because addressing inventory needs will also raise awareness of the healthy status of some species that were previously not know due to inadequate observational or monitoring data. It is impossible in most cases to link specific

conservation actions to the success or failure of a species and for this reason, the SOC list is used as a tool for helping to gauge success not quantify it.

Identifying if conservation strategies identified for each of the Tier I species are being implemented will also be used as a performance measure for this component. Implementation will be measured as not implemented, partially implemented, fully implemented, or ongoing indefinite implementation needed. The FWP Responsive Management Unit will coordinate the revision of this component in coordination with the Information Management Unit and FWP fish and wildlife staff every six years in collaboration with our partners and with public review.

Inventory

The FWP Information Management Unit will measure success in the inventory component of the Strategy annually. The performance measure for this component will be the FWP/NHP point observation database (POD). The database is the statewide clearinghouse for fish and wildlife species data from many agencies and organizations such as FWP, NHP, USFS, TNC and The Audubon Society for species not currently being monitored any other way. The POD will be queried to determine if gaps in occurrence data for species and species groups identified in the Strategy as in greatest need of inventory have been met. The Tier assignments for species and species groups will be recalculated based on the updated POD and other information and revised priorities for Inventory will be updated in the web based Strategy and then transmitted to FWP's collaborators. The FWP Responsive Management Unit will coordinate the revision of this component in coordination with the Information Management Unit and FWP fish and wildlife staff every six years in collaboration with our partners and with public review.

Law Enforcement, Con/Ed, and State Parks

To date, Congressional wording of legislation has not allowed, or as limited, the direct allocation of SWG funds to projects pertaining to law enforcement, outreach or activities in state parks. This does not mean that opportunities do not exist for developing projects within these areas that would provide benefits to species and habitats in greatest need of conservation. In fact, activities of this type have already been and continue to be conducted within each of these areas without SWG funding. Law enforcement officers regularly use domestic livestock to assist fisheries biologists with the transport of arctic grayling and cutthroat trout for restoration projects occurring in wilderness and remote areas of the state. Montana Fish, Wildlife & Parks Conservation Education staff have been instrumental in helping develop information strategies for the SWG planning efforts, and are actively involved in issues related to many species and habitats described in this Strategy such as loons, native fish, and invasive species that require intense education and information campaigns in order to address human related conservation concerns. Montana's State Parks have been involved with recent inventory of small mammals, bats and other wildlife species that have been identified as in greatest need and offer an unequaled venue for communicating the foundations of comprehensive conservation to Montana's public through interpretation and hands on experience. Montana Fish, Wildlife & Parks firmly believes that the successful implementation of this Strategy will require that law enforcement, conservation education and state parks be engaged in activities and be eligible for funding.

The following list is intended to provide examples of how these areas of FWP could be integrated with the implementation of the FWP Comprehensive Fish and Wildlife Conservation Strategy. The list is not complete, but should provide an idea of the diversity of opportunity that exists and will be required.

Law Enforcement

- Investigation and prosecution of individuals who seek to profit through the commercial exploitation of sensitive species or species of special concern
- Regular patrols, presence and covert operations in areas where sensitive species projects (such as brood stock ponds or in-channel spawning and rearing areas for natives fish) and efforts are in process
- Investigate and prosecute illegal introductions of fish and wildlife. Provide an enforcement presence in areas where the transportation of live fish to other bodies of water is suspected to occur
- Through SWG, augment financial resources through overtime and other means, for special species related projects that merit an enhanced presence or protection by law enforcement officers

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- Participate in the planning and management of sensitive species, offering social component information in season-setting, season-types or special regulations for certain areas that would serve to enhance certain game species of concern
- Utilize relationships built with other resource agency's law enforcement and wildlife control divisions in the protection and enhancement of sensitive species
- Focus attention on violations associated with snowmobiles, ATV's, and water-based recreation that directly affect fish and wildlife and their habitats during certain times of the year
- Expand investigations and prosecution of individuals involved in the introduction of non-native or exotic plants and animals
- Continue a leadership role in the on-the-ground efforts to resolve conflicts between wildlife and humans (bears, ungulates in urban environments, etc.) Develop new technologies, equipment and approaches to reduce the effects of wildlife damage to private property
- Provide the equipment and technical expertise in the logistics of transporting personnel, equipment and fish/wildlife species in restoration efforts
- Provide increased field assistance as well as informational support to biologists in the carrying-out of fish and wildlife inventories, tagging and marking operations, etc.
- Dovetail efforts with the Conservation Education Division in preparing sensitive species issues presentations in public forums such as Hunter Education classes, school programs, and in the media. Work with biologists to conduct inventory of fish and wildlife through tagging, investigation of illegal kills and harvest, and road kills. Special opportunities exist in wilderness and remote areas where officers can provide domestic livestock for transportation. Opportunities exist at check stations and especially with species such as wolves, raptors, and furbearers.
- Work directly with biologists with species related to issues such as disease, and re-introduction
- Help conserve habitats by addressing issues related to snowmobiles and ATV's, no-wake zones, exotic introductions of plants and animals, human/bear and wolf conflicts, 310 permit violations

Conservation Education

Montana Fish, Wildlife & Parks' mission is to provide for the stewardship of the fish, wildlife, parks and recreational resources of Montana, while contributing to the quality of life for present and future generations. To carry out its mission, FWP's Conservation Education Division strives to provide and support fiscally responsible programs that help Montanans and other understand and appreciate the importance of the conservation and management of Montana's:

- Aquatic ecosystems, habitats, and species
- Terrestrial ecosystems, habitats, and species
- Important cultural and recreational resources

Under the CFWCS, FWP Conservation Education will focus on programs to:

- Provide aquatic education and information materials and programs to the public, to schools and teachers
- Develop, refine, and expand native fish species program
- Provide information about the problems caused by illegal introductions
- Conduct aquatic education and comprehensive fisheries management training for FWP staff
- Enhance the stewardship of public and private lands, and their wildlife inhabitants through education
- Increase knowledge of species identified as being in greatest conservation need
- Provide wildlife-oriented information and educational efforts to meet hunting and non-hunting public needs and to address changing social conditions
- Offer education and information programs to help people learn to live with all wildlife and reduce wildlife/human conflicts

State Parks

- Provide sites for the inventory of fish and wildlife species on State Park properties
- Work with Con/Ed to create interpretive programs that inform the public about comprehensive conservation

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- Provide programs that educate and inform the public about the species and habitats in greatest need of conservation and what conservation activities need to occur in order to conserve them

Methods

The Strategy is organized from broad-scale (ecotype/focus area) to fine-scale (species). However, the priorities were actually developed using methods that working from species to ecotype/focus areas. Our first step was to update our occurrence databases and assess updated databases to determine which native Montana species are in greatest need of conservation (Tier I). Please refer to Categorizing the Levels of Conservation Need in the Introduction of this Strategy for complete definitions of the Tiers used in this document. Using this information, community types were identified that offer some of the greatest opportunity to conserve these Tier I species. Finally, the community types in greatest need of conservation were used to locate the areas of the state where those communities are the richest and offer some of the best opportunities for comprehensive conservation of all associated species and their habitats.

Species

During the first year of planning, we collected as much observational data as possible from all agencies and organizations in Montana for incorporation into existing FWP and Natural Heritage Program (NHP) Point Observation Database (POD). More than 130,000 new observations were added during this period. The updated database was used by FWP and NHP to review the Montana Species of Concern List (except fish). A matrix was developed that included all species occurring in Montana with their corresponding score for each of the fields listed below.

MP = Management plan (0=no, 1=yes)

CF = Current funding (0=none, 1=partial, 3=full)

CM = Current management effort (0=none, 1=group level, 2=species specific)

SC = Species of Concern Rank (1=S1, 2=S2, 3=S3, 4=S4, 5=S5)

LR = Limited MT Range (0=yes, 1=no)

LT = Existing local threats (0=yes, 1=no)

I = Incidental to Montana (default to Tier IV)

N = Non-native species (default to Tier IV)

Tiers for conservation need had previously been identified for birds by the Partners-in-Flight effort and for fish by a separate FWP effort. We used these existing Tier assignments to model the following equation and then calculated the original draft Tiers assignment for all species including land birds and fish using this equation.

$$\text{Tier} = (\text{CF} + \text{CM} + 2 * \text{SC}) / 4 + \text{MP} / 4 + \text{LR} - \text{LT}$$

Staff from NHP and staff from each of FWP's 7 Regions reviewed the draft tiers and recommended if species should be reassigned to a different level Tier. The planning team was concerned about not including a species in Tier I that should

have been and adopted the following rules for adjusting Tier assignments. It required only one FWP Region indicated that any species should be assigned a greater conservation need status such as from Tier II or Tier III to a Tier I, for that species to be reassigned. However, it required at least 2 FWP administrative regions indicating a species should be reassigned from a Tier II to a Tier III and 3 Regions indicating a species should be reassigned from a Tier I to a Tier II before an adjustment was made.

The SWG Technical and Steering Committees then reviewed the species Tier assignments and made some final adjustments based on knowledge of future funding and management issues. All contacts from the agencies and non-governmental organizations that were invited to the October 2003 exploratory group were emailed the draft list and comments were received and incorporated. The final draft of the species tier assignments was then reviewed and approved by the SWG Steering Committee (Table 3).

Community Types

Although fish and wildlife communities have never been formally established for Montana, associations were developed between species and their related habitats to the degree that we have described them in this Strategy as community types. Future efforts should be made to define and validate fish and wildlife communities for Montana. To begin developing communities and identify those in greatest need of conservation, the FWP Technical Committee, field staff and, Habitat Montana staff determined the scales and coverages best suited for assessing the levels of community type conservation need. Three mapable coverages were selected to allow for planning at three scales, 1) the FWP Habitat Montana ecotypes 2) USFS subsections (HUC for aquatic ^{*1}), and 3) GAP 50 cover types ^{*2} (habitat descriptors for aquatic ^{*3}), (Montana Fish, Wildlife and Parks 1991, Nesser et.al 1997, Fisher et. al 1998). All riparian and wetland covertypes from the GAP 50 were combined to create one covertype. The same was done for sagebrush and salt flats, shrub grassland associations, and grassland covertypes. Cover types with minor associations such as snow and rock were removed prior to any analysis. Fish and wildlife species addressed in the strategy were linked with the GAP covertypes to establish essential and general biological associations that are described in this strategy as community types. The newly created community types were then linked with the USFS subsections and HUC's and finally with the FWP Habitat Montana ecotypes.

GAP covertypes, such as for grasslands, one of Montana's most important habitats, are based on the amount of grass cover interpretable by remote sensing. They are not strongly associated with ecological site factors or a recognized vegetation classification like the National Vegetation Classification System. Future classifications and maps will have a stronger relationship to habitat if they are ecological and based on data that are more comprehensive. The scale of GAP coverage is often also not suitable for comprehensive mapping

of wetlands and riparian areas, another significant habitat, which often occur as narrow or small areas. These habitats will be better known and managed if National Wetlands Inventory mapping or a similar product is completed for Montana.

*1 Note: We initially used USFS subsections for aquatic but later changed to HUC 4 to better represent aquatic communities

*2 Note: For clarity of description, GAP 50 cover types were used as a surrogate for habitat

*3 Note: Aquatic communities were described as prairie streams, mixed source rivers, intermountain valley rivers, intermountain valley streams, mountain streams, prairie rivers, lowland lakes, lowland reservoirs, mountain lakes, and mountain reservoirs.

A habitat matrix containing all community types along with the information listed below was developed and the following formula was used to calculate draft tiers for all community types within each subsection or HUC.

$$((S+AR+SAR+CR+CCR)/5)$$

S = Percentage of cover type in stewardship (1=private, 2=public, 3=wilderness/park)

AR = Animal richness (1=(>100), 2=(11 to 100), 3=(0 to 10))

SAR = Average of SWG Tier ranks for animal richness (1=(0 to 2.34), 2=(2.34 to 2.647), 3=(2.647 to 3))

CR = NHP Community richness (1=(47 to 100), 2=(16 to 46), 3=(0 to 15))

CCR = NHP Community of concern richness (1=(10 to 17), 2=(4 to 9), 3=(0 to 3))

Staff from FWP administrative regions reviewed draft tiers that were assigned to each community type within the subsection or HUC under their authority and adjustments to Tier assignment were made. Reviewers also scored the level of threat (high, medium or low) associated with the community type within each subsection or HUC. An average statewide Tier was calculated for each community type using the staff's adjusted Tier assignments for each community type within subsections and HUC's (Tables 4 and 5).

Focus Areas

USFS Subsections and HUC's were inserted with the final statewide community type Tier assignments to determine what areas contained the greatest percentage of Tier I community types. These subsections and HUC's were assigned Tier I status. Staff from FWP administrative regions were provided opportunities to review and comment on the draft focus area tier assignments. Habitat Montana, Upland Game Bird Habitat Enhancement, and Future Fisheries Staff involved with administration of the programs then reviewed all adjusted draft tier assignments. Technical and Steering Committees reviewed and approved

community and focus area Tier assignments. Tier I focus areas were then organized by Ecotype (Tables 6 and 7).

Inventory

The inventory component addresses species in greatest need of collecting data in order to establish the occurrence and distribution of that species. The inventory component was designed to help direct survey efforts toward species and groups of species that have inadequate occurrence data.

A inventory matrix was developed using the following information and all groups of species and individual species were assigned a Tier I, II, or III (Tables 8 and 9).

IIS = Need for inventory of individual species

ISP = Need for inventory of species group (ISP 1 – 2.3 = Tier 1, ISP 2.4 – 2.6 = Tier 2, ISP 2.7 – 3 = Tier 3)

IE = inventory effort (observation points in point observation database): (0 to 100)=1, (101 to 500)=2, (> 500)=3

I/P = incidental/peripheral species: 1 = native incidental/peripheral, 2 = native not incidental/peripheral

ST= sum of Tier scores for all species in a given taxonomic group

SP= number of species in a taxonomic group

$IIS = (IE + 1/P)/2$ and $ISP = ST/SP$

Tables**Table 1. Conservation & Management Plans of Montana**

Note: This is not a complete list of all management plans prepared for Montana. Please alert us to any additional plans for inclusion.

Author	Year	Title
Amphibians & Reptiles		
Maxell, Bryce A.	2000	Management of Montana's amphibians: A Review of factors that may present a risk to population viability and accounts on the identification, distribution, taxonomy, habitat use, natural history and the status and conservation of individual species. Contract No. 43-0343-0-0224.
Fisheries		
Jones-Wuellner, Melissa R. and Guy, Christopher S.	2004	Status of Burbot in Montana. Prepared for Montana Fish, Wildlife & Parks. Montana Cooperative Fisheries Research Unit, Montana State University-Bozeman.
Montana Department of Fish, Wildlife & Parks	2004	Memorandum of Understanding and Conservation Agreement for Sauger (<i>Sander canadensis</i>) in Montana. 23 pg. Draft In progress.
May, B. E., Urie, W., Shepard, B.B., Montana Cooperative Fishery Research Unit.	2003	Range-wide status of Yellowstone Cutthroat Trout (<i>Oncorhynchus clarki bouvieri</i>): 2001.
Shepard, Brad B., May, B.E, Urie, W.	2003	Status of Westslope Cutthroat Trout (<i>Onchorhyncus clarki lewisi</i>) in the United States 2002. Westslope Cutthroat Conservation Team.
U. S. Fish and Wildlife Service	2002	Endangered and Threatened Wildlife and Plants; Bull Trout (<i>Salvelinus confluentus</i>) Draft Recovery Plan. Available: http://pacific.fws.gov/bulltrout/recovery/Default.htm . (February 2003).
Magee, James P.	2000	Montana fluvial arctic grayling recovery project : annual monitoring report
MBTRT (Montana Bull Trout Restoration Team).	2000	Restoration plan for bull trout in the Clark Fork River basin and Kootenai River basin, Montana. Montana Department of Fish, Wildlife & Parks, Helena. 116 intermountain/foothill grassland.

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Montana Department of Fish, Wildlife & Parks.	2000	Cooperative Conservation Agreement for Yellowstone Cutthroat Trout within Montana between Crow Tribe, Montana Department of Fish, Wildlife & Parks (FWP), Montana Department of Environmental Quality (DEQ), Montana Department of Natural Resources and Conservation (DNRC), USDA-Forest Service, Northern Region, Gallatin & Custer National Forests, USDI-Bureau of Land Management – Montana (BLM), USDI-Fish and Wildlife Service (FWS), USDI-Bureau of Indian Affairs (BIA), Yellowstone National Park.
Montana Fish, Wildlife & Parks.	1999	Memorandum of Understanding and Conservation Agreement for Westslope Cutthroat Trout (<i>Onchorhynchus clarki lewisi</i>) in Montana.
U.S. Department of Interior, Fish and Wildlife Service	1999	White Sturgeon; Kootenai River Population Recovery Plan. Region 1, USFWS, Portland, Oregon
May, B. E.	1998	Yellowstone cutthroat trout: current status and conservation recommendations with the state of Montana. U.S. Forest Service, Gallatin National Forest, Bozeman, Montana.
Montana Fluvial Arctic Grayling Workgroup	1995	Montana Fluvial Arctic Grayling Restoration Plan. Montana Department of Fish, Wildlife, and Parks, Helena.
North Dakota Game & Fish Department, Montana Department of Fish, Wildlife & Parks & University of Idaho	1995	Montana-North Dakota Paddlefish Management Plan. A cooperative venture between: North Dakota Game & Fish Department, Montana Department of Fish, Wildlife & Parks & University of Idaho. 45 pgs.
Yellowstone Cutthroat Trout Working Group	1994	Yellowstone cutthroat trout (<i>Oncorhynchus clarki bouvieri</i>) management guide for the Yellowstone River drainage. Montana Department of Fish, Wildlife & Parks, Helena, and Wyoming Game and Fish Department, Cheyenne.
Fluvial Arctic Grayling Workgroup.	1993	Fluvial arctic grayling conservation plan. [unpublished draft]. 44 pp.
U.S. Fish and Wildlife Service.	1993	Pallid sturgeon recovery plan. U.S. Fish and Wildlife Serv., Bismarck, N.D. 55 pp.
Kaya, Calvin M.	1990	Status Report on Fluvial Arctic Grayling (<i>Thymallus arcticus</i>) in Montana. Biology Department, Montana State University. Bozeman, MT. Prepared for: FWP. Helena, MT
Montana Department of Fish, Wildlife, and Parks.	1989	Hauser Reservoir: fisheries management plan: September 1989-September 1994. 16 pp.
Schrader, William C.	1989	Trout Mortality, Movements, and Habitat Selection During Winter in South Willow Creek, MT

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Birds		
Montana Sage-grouse Work Group	2004	Management plan and covservation strategies for sage-grouse in Montana
Rich, T.D., C.J. Beardmore, H. Berlanga, P.J. Blancher, M. S. W. Bradstreet, G. S. Butcher, D.W. Demarest, E. H. Dunn, W. C. Hunter, E. E. Inigo-Elias, J. A. Kennedy, A. M. Martell, A. O. Panjabi, D. N. Pashley, K. V. Rosenberg, C. M. Rustay, J. S. Wendt, T. C. Will.	2004	Partners in Flight North American Landbird Conservation Plan. Cornell Lab of Ornithology. Ithaca, NY.
Klute, D. S., L.W. Ayers, M.T. Green, W.H. Howe, S.L. Jones, J.A. Shaffer, S.R. Sheffield, and T.S. Zimmerman	2003	Status Assessment and Conservation Plan for the Western Burrowing Owl in the United States. U.S. Department of the Interior; Fish and Wildlife Service, Biological Technical Publication FWS/BTP-R6001-2003, Washington, D.C.
Montana Piping Plover Working Group	2003	Montana Piping Plover Management Plan. Unpublished Report. 35 pp.
Pacific Flyway Council and USFWS	2003	Pacific Flyway Implementation Plan for the Rocky Mountain Population of Trumpeter Swans 2003 Annual Report. 29 pp.
James A. Kushlan, Melanie J. Steinkamp, Katherine C. Parsons, Jack Capp, Martin Acosta Cruz, Malcolm Coulter, Ian Davidson, Loney Dickson, Naomi Edelson, Richard Elliot, R. Michael Erwin, Scott Hatch, Stephen Kress, Robert Milko, Steve Miller, Kyra Mills, Richard Paul, Roberto Phillips, Jorge E. Saliva, Bill Sydeman, John Trapp, Jennifer Wheeler, and Kent Wohl.	2002	Waterbird Conservation for the Americas: The North American Waterbird Conservation Plan, Version 1. Waterbird Conservation for the Americas, Washington, D.C. U.S.A., 78 pp.
Brown, S., C. Hickey, B. Harrington, and R. Gill, eds.	2001	The U.S. Shorebird Conservation Plan, 2nd ed. Manomet Center for Conservation Sciences, Manomet, MA.
Casey, D.	2000	Partners in Flight Bird Conservation Plan Montana Version 1.0. Montana Partners in Flight. Kalispell, Montana.
North America Waterfowl Planning Team	1998	North American Waterfowl Management Plan. Expanding the Vision-Update. 32 pp.
Mississippi and Central Flyway Councils	1997	Subcommittee on the Interior Population of Trumpeter Swans. Mississippi and Central flyway management plan for the Interior population of Trumpeter Swan. Mississippi and Central Flyway Councils. [C/o USFWS, Migratory Bird Coordinator] Twin Cities, MN

DRAFT WORKING DOCUMENT DO NOT DUPLICATE

Subcommittee on the Interior Population of Trumpeter Swans.	1997	Mississippi and Central flyway management plan for the Interior population of Trumpeter Swan. Mississippi and Central Flyway Councils. c/o USFWS, Migratory Bird Coordinator Twin Cities, M
Cassirer, E. F., J. D. Reichel, R. L. Wallen, and E. C. Atkinson.	1996	Harlequin Duck (<i>Histrionicus histrionicus</i>) conservation assessment and strategy for the U.S. Rocky Mountains. Unpublished Technical Report, Idaho Department of Fish and Game, Lewiston, Idaho, U.S.A.
Montana Bald Eagle Working Group.	1994	Montana Bald Eagle management plan. 2nd edition. Bureau of Reclamation. 104 pp.
U.S. Fish and Wildlife Service.	1994	Revised recovery plan for piping plovers <i>CHARADRIUS MELODUS</i> breeding on the Great Lakes and Northern Great Plains. 121 pp.
Sidle, J. G. and W. F. Harrison.	1990	Recovery plan for the interior population of the Least Tern (<i>STERNA ANTILLARUM</i>). U.S. Fish and Wildlife Service. 90 pp.
Skaar, D.	1990	Montana common loon management plan. Unpublished report prepared for U.S. Forest Service, Region 1. 61 pp.
Haig, S., et al.	1988	Recovery plan for piping plovers <i>CHARADRIUS MELODUS</i> of the Great Lakes and northern great plains. U.S. Fish & Wildlife Service, 160pp.
Skaar, D.	1988	Creation of a management plan for the common loon in Montana. Intermountain/foothill grassland 101-102 in: North American Loon Fund conference report
U.S. Fish and Wildlife Service.	1988	Great Lakes and northern Great Plains piping plover recovery plan. 160 pp.
Zubik, R. J.	1988	A site specific management plan for the lower Stillwater bald eagle territory. Unpublished report. Montana Department of Fish, Wildlife, and Parks, Kalispell. 43 PP.
Bureau of Land Management.	1986	Montana Bald Eagle Management Plan. U.S.D.I., Billings, MT.
Escano, R., D. Flath, R. Hazelwood and B. Klaver. (eds.).	1986	Montana eagle management plan. Montana Bald Eagle Working Group. BLM, MT State Office. 61pp.
Will, G. C.	1986	Waterfowl, Sandhill Crane and Snipe Management Plan
Trumpeter Swan Recovery Group	1984	The North American Management Plan for Trumpeter Swans
U.S. Fish and Wildlife Service.	1984	American peregrine falcon recovery plan (Rocky Mtn./southwest population). Prepared in cooperation with American peregrine falcon recovery team. USFWS, Denver, CO.
U.S. Fish and Wildlife Service, Division of Wildlife Management.	1981	Draft western golden eagle management plan. Washington, D.C.

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Olsen, David L.	1980	Whooping Crane Recovery Plan. Whooping Crane Recovery Team (USFWS, Nebraska Game and Parks Commission, Texas Parks & Wildlife Department, National The Audubon Society Society). 206 pp.
Whooping Crane Recovery Team: U.S. Fish & Wildlife Service, Nebraska Game and Parks Commission, Texas Parks & Wildlife Department, National The Audubon Society Society	1980	Whooping Crane Recovery Plan
Molini, W. A.	1976	Chukar Partridge, Species Management Plan
Mammals		
Montana Fish, Wildlife & Parks	2003	Montana Gray Wolf Conservation and Management Plan
Montana Prairie Dog Working Group	2002	Conservation plan for black-tailed and white-tailed prairie dogs in Montana
Montana Fish, Wildlife & Parks.	2002	Grizzly bear management plan for southwestern Montana : 2002-2012
Montana Fish, Wildlife & Parks	2001	Conservation plan for grizzly bear in Montana
Ruediger, Bill & 14 others on Lynx Biology Team	2000	Canada Lynx Conservation Assessment and Strategy. 120 pp.
USDI National Park Service.	2000	Bison Management for the State of Montana and Yellowstone National Park. Final Environmental Impact Statement for the Interagency Bison Management Plan for the State of Montana and Yellowstone National Park. Vol. I.
Pierson, E.D., M.C. Wackenhut, J.S. Altenbach, P. Bradley, P. Call, D.L. Genter, C. E. Harris, B. L. Keller, B. Lengus, L. Lewis, B. Luce, K. W. Navo, J. M. Perkins, S. Smith, and L. Welch	1999	Species conservation assessment and strategy for Townsend's big-eared bat (<i>Corynorhinus townsendii townsendii</i> and <i>Corynorhinus townsendii pallescens</i>). Idaho Conservation Effort, Idaho Department of Fish and Game, Boise, Idaho.
Montana Department of Livestock and Montana Fish, Wildlife & Parks.	1996	Interim bison management plan. 70 pp.
Montana Fish, Wildlife & Parks	1996	Management of Mountain Lions in Montana: Final EIS
Servheen, C.	1993	Grizzly bear recovery plan. Unpublished report to the U.S. FWS. University of Montana, Missoula. 181 pp.
Montana Fish, Wildlife & Parks	1992	North Central Montana Black-footed ferret reintroduction and management plan. Prepared by North Central Montana Working Group. 59 pp.

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Shaffer, M.	1992	Keeping the grizzly bear in the American West: an alternative recovery plan. The Wilderness Society, Washington, D.C.
Casey, D., and P. Malta	1990	Long-term habitat management plan for elk and mule deer winter range enhancement
U.S. Fish and Wildlife Service.	1990	firefighter mountain and spotted bear winter ranges
U.S. Fish and Wildlife Service (USFWS).	1990	Grizzly bear recovery plan (Draft). Unpubl. Rep., Missoula, MT. 117 pp.
U.S. Fish and Wildlife Service.	1988	Black-footed ferret recovery plan. Denver, CO. 154 pp.
U.S. Fish and Wildlife Service.	1987	Northern Rocky Mountain wolf recovery plan. U.S. Fish and Wildlife Service, Denver CO. 119 pp.
Dood, A.R., Brannon R.D., Mace, R.D.	1986	Final Programmatic Environmental Impact Statement, the Grizzly Bear in Northwestern Montana. Montana Department of Fish, Wildlife & Parks.
Parker, T. and M. Scott	1985	Bighorn Sheep Management Plan
U.S. Fish and Wildlife Service.	1984	Selkirk mountain caribou management/recovery plan. U.S. Fish Wildlife Service, Portland, Oregon. 121 pp.
Tsukamoto, G.K.	1983	Pronghorn Antelope species management plan
U.S. Fish and Wildlife Service.	1982	Grizzly bear recovery plan. Unpublished report prepared in cooperation with the Recovery Team Leader, Don L. Brown of the MT DFWP. 195 pp.
Joslin, G.	1980	Mountain goat habitat management plan for the Cabinet Mountains, Montana. MT. Dept. Fish, Wildl. and Parks and Kootenai National Forest.
Northern Rocky Mountain Wolf Recovery Team.	1980	Northern Rocky Mountain wolf recovery plan interagency report. 67 pp.
Bureau of Land Management.	1979	Habitat management plan prairie dog ecotypes. USDI, BLM, Montana State Office. Wildlife Habitat Area MT-02-06-07-S1. 61 pp.
Anderson, M. E. et al.	1978	Black-footed ferret recovery plan. U.S. Fish and Wildlife Service Black-footed ferret Recovery Team. 150 pp.
Greenwalt, L. A.	1978	Black-footed ferret recovery plan
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Smith, C. A., and G. N. Boz	1977	Management plans for alternative uses of wildlife
USDA, Forest Service.	1977	Western spruce budworm management plan.
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14407 **Table 2. Species Reference Chart**
 14408

Species	Page Number
Long-toed Salamander	
Tiger Salamander	
Coeur D'Alene Salamander	
Roughskin Newt	
Idaho Giant Salamander	
Rocky Mountain Tailed Frog	
Boreal Toad	
Great Plains Toad	
Canadian Toad	
Woodhouse's Toad	
Boreal Chorus Frog	
Pacific Treefrog	
Plains Spadefoot	
Great Basin Spadefoot	
Bullfrog	
Northern Leopard Frog	
Wood Frog	
Columbia Spotted Frog	
Barn Owl	
Flammulated Owl	
Eastern Screech-owl	
Western Screech-owl	
Great Horned Owl	
Snowy Owl	
Northern Hawk Owl	
Northern Pygmy-owl	
Burrowing Owl	
Barred Owl	
Great Gray Owl	
Long-eared Owl	
Short-eared Owl	
Boreal Owl	
Northern Saw-whet Owl	
Rock Dove	
Band-tailed Pigeon	
Eurasian Collared-dove	
White-winged Dove	
Black-billed Cuckoo	
Yellow-billed Cuckoo	
Common Nighthawk	
Common Poorwill	
Whip-poor-will	
Black Swift	

Chimney Swift
Vaux's Swift
White-throated Swift
Ruby-throated Hummingbird
Black-chinned Hummingbird
Anna's Hummingbird
Calliope Hummingbird
Broad-tailed Hummingbird
Rufous Hummingbird
Belted Kingfisher
Lewis's Woodpecker
Red-headed Woodpecker
Red-bellied Woodpecker
Yellow-bellied Sapsucker
Williamson's Sapsucker
Red-naped Sapsucker
Downy Woodpecker
Hairy Woodpecker
White-headed Woodpecker
Three-toed Woodpecker
Black-backed Woodpecker
Northern Flicker
Pileated Woodpecker
Olive-sided Flycatcher
Western Wood-pewee
Eastern Wood-pewee
Yellow-bellied Flycatcher
Alder Flycatcher
Willow Flycatcher
Least Flycatcher
Hammond's Flycatcher
Dusky Flycatcher
Cordilleran Flycatcher
Eastern Phoebe
Say's Phoebe
Ash-throated Flycatcher
Great Crested Flycatcher
Cassin's Kingbird
Western Kingbird
Eastern Kingbird
Scissor-tailed Flycatcher
Horned Lark
Purple Martin
Tree Swallow
Violet-green Swallow
Northern Rough-winged Swallow

Bank Swallow
Cliff Swallow
Barn Swallow
Gray Jay
Steller's Jay
Blue Jay
Pinyon Jay
Clark's Nutcracker
Black-billed Magpie
American Crow
Common Raven
Black-capped Chickadee
Mountain Chickadee
Boreal Chickadee
Chestnut-backed Chickadee
Red-breasted Nuthatch
White-breasted Nuthatch
Pygmy Nuthatch
Brown Creeper
Rock Wren
Canyon Wren
Bewick's Wren
House Wren
Winter Wren
Sedge Wren
Marsh Wren
American Dipper
Golden-crowned Kinglet
Ruby-crowned Kinglet
Blue-gray Gnatcatcher
Eastern Bluebird
Western Bluebird
Mountain Bluebird
Townsend's Solitaire
Veery
Gray-cheeked Thrush
Swainson's Thrush
Hermit Thrush
Wood Thrush
American Robin
Varied Thrush
Gray Catbird
Northern Mockingbird
Sage Thrasher
Brown Thrasher
American Pipit

Sprague's Pipit
Bohemian Waxwing
Cedar Waxwing
Northern Shrike
Loggerhead Shrike
European Starling
Warbling Vireo
Philadelphia Vireo
Red-eyed Vireo
Cassin's Vireo
Golden-winged Warbler
Tennessee Warbler
Orange-crowned Warbler
Nashville Warbler
Northern Parula
Yellow Warbler
Chestnut-sided Warbler
Magnolia Warbler
Cape May Warbler
Black-throated Blue Warbler
Yellow-rumped Warbler
Black-throated Gray Warbler
Townsend's Warbler
Black-throated Green Warbler
Blackburnian Warbler
Yellow-throated Warbler
Pine Warbler
Prairie Warbler
Palm Warbler
Bay-breasted Warbler
Blackpoll Warbler
Black-and-white Warbler
American Redstart
Prothonotary Warbler
Ovenbird
Northern Waterthrush
Kentucky Warbler
Connecticut Warbler
Mourning Warbler
Macgillivray's Warbler
Common Yellowthroat
Hooded Warbler
Wilson's Warbler
Canada Warbler
Painted Redstart
Yellow-breasted Chat

Summer Tanager
Scarlet Tanager
Western Tanager
Northern Cardinal
Rose-breasted Grosbeak
Black-headed Grosbeak
Lazuli Bunting
Indigo Bunting
Painted Bunting
Dickcissel
Green-tailed Towhee
Spotted Towhee
American Tree Sparrow
Chipping Sparrow
Clay-colored Sparrow
Brewer's Sparrow
Field Sparrow
Vesper Sparrow
Lark Sparrow
Black-throated Sparrow
Sage Sparrow
Lark Bunting
Savannah Sparrow
Baird's Sparrow
Grasshopper Sparrow
Le Conte's Sparrow
Nelson's Sharp-tailed Sparrow
Fox Sparrow
Song Sparrow
Lincoln's Sparrow
Swamp Sparrow
White-throated Sparrow
Golden-crowned Sparrow
White-crowned Sparrow
Harris's Sparrow
Dark-eyed Junco
McCown's Longspur
Lapland Longspur
Smith's Longspur
Chestnut-collared Longspur
Snow Bunting
Bobolink
Red-winged Blackbird
Western Meadowlark
Yellow-headed Blackbird
Rusty Blackbird

Brewer's Blackbird
Great-tailed Grackle
Common Grackle
Brown-headed Cowbird
Orchard Oriole
Hooded Oriole
Baltimore Oriole
Bullock's Oriole
Brambling
Black Rosy-finch
Gray-crowned Rosy-finch
Pine Grosbeak
Purple Finch
Cassin's Finch
House Finch
Red Crossbill
White-winged Crossbill
Common Redpoll
Hoary Redpoll
Pine Siskin
Lesser Goldfinch
American Goldfinch
Evening Grosbeak
House Sparrow
Turkey Vulture
Osprey
Bald Eagle
Northern Harrier
Sharp-shinned Hawk
Cooper's Hawk
Northern Goshawk
Red-shouldered Hawk
Broad-winged Hawk
Swainson's Hawk
Red-tailed Hawk
Ferruginous Hawk
Rough-legged Hawk
Golden Eagle
American Kestrel
Merlin
Peregrine Falcon
Gyr Falcon
Prairie Falcon
Yellow Rail
Virginia Rail
Sora

Common Moorhen
American Coot
Greater Sandhill Crane
Lesser Sandhill Crane
Whooping Crane
Black-bellied Plover
American Golden-plover
Snowy Plover
Semipalmated Plover
Piping Plover
Killdeer
Mountain Plover
Black-necked Stilt
American Avocet
Greater Yellowlegs
Lesser Yellowlegs
Solitary Sandpiper
Willet
Spotted Sandpiper
Upland Sandpiper
Whimbrel
Long-billed Curlew
Hudsonian Godwit
Marbled Godwit
Ruddy Turnstone
Black Turnstone
Red Knot
Sanderling
Semipalmated Sandpiper
Western Sandpiper
Least Sandpiper
White-rumped Sandpiper
Baird's Sandpiper
Pectoral Sandpiper
Dunlin
Curlew Sandpiper
Stilt Sandpiper
Buff-breasted Sandpiper
Short-billed Dowitcher
Long-billed Dowitcher
Common Snipe
American Woodcock
Wilson's Phalarope
Red-necked Phalarope
Red Phalarope
Pomarine Jaeger

Parasitic Jaeger
Long-tailed Jaeger
Laughing Gull
Franklin's Gull
Bonaparte's Gull
Mew Gull
Ring-billed Gull
California Gull
Herring Gull
Thayer's Gull
Glaucous-winged Gull
Glaucous Gull
Great Black-backed Gull
Black-legged Kittiwake
Sabine's Gull
Ivory Gull
Caspian Tern
Common Tern
Arctic Tern
Forster's Tern
Least Tern
Black Tern
Marbled Murrelet
Ancient Murrelet
Gray Partridge
Chukar
Ring-necked Pheasant
Spruce Grouse
Blue Grouse
Willow Ptarmigan
White-tailed Ptarmigan
Ruffed Grouse
Sage-grouse
Sharp-tailed Grouse
Columbia Sharp-tailed Grouse
Wild Turkey
Mourning Dove
Red-throated Loon
Pacific Loon
Common Loon
Yellow-billed Loon
Pied-billed Grebe
Horned Grebe
Red-necked Grebe
Eared Grebe
Western Grebe

Clark's Grebe
American White Pelican
Double-crested Cormorant
American Bittern
Least Bittern
Great Blue Heron
Great Egret
Snowy Egret
Little Blue Heron
Cattle Egret
Green Heron
Black-crowned Night-heron
Yellow-crowned Night-heron
White-faced Ibis
Wood Stork
Tundra Swan
Trumpeter Swan
Mute Swan
Greater White-fronted Goose
Snow Goose
Ross' Goose
Brant
Canada Goose
Wood Duck
Green-winged Teal
American Black Duck
Mallard
Northern Pintail
Garganey
Blue-winged Teal
Cinnamon Teal
Northern Shoveler
Gadwall
Eurasian Wigeon
American Wigeon
Canvasback
Redhead
Ring-necked Duck
Greater Scaup
Lesser Scaup
Harlequin Duck
Long Tailed Duck
Black Scoter
Surf Scoter
White-winged Scoter
Common Goldeneye

Barrow's Goldeneye
Bufflehead
Hooded Merganser
Common Merganser
Red-breasted Merganser
Ruddy Duck
Mottled Sculpin
Slimy Sculpin
Torrent Sculpin
Spoonhead Sculpin
White Sturgeon
Lake Whitefish
Yellowstone Cutthroat Trout
Westslope Cutthroat Trout
Columbia Basin Redband Trout
Pygmy Whitefish
Mountain Whitefish
Bull Trout
Lake Trout (native lakes)
Arctic Grayling
Peamouth
Northern Pikeminnow
Redside Shiner
Longnose Sucker
White Sucker
Largescale Sucker
Mountain Sucker
Trout-perch
Burbot
Cisco
Kokanee Salmon
Chinook Salmon
Rainbow Trout
Golden Trout
Brown Trout
Brook Trout
Rainbow Smelt
Northern Pike
Goldfish
Common Carp
Utah Chub
Golden Shiner
Spottail Shiner
Black Bullhead
Yellow Bullhead
Plains Killifish

Western Mosquitofish
Sailfin Molly
Shortfin Molly
Green Swordtail
Variable Platyfish
White Bass
Rock Bass
Green Sunfish
Pumpkinseed
Bluegill
Smallmouth Bass
Largemouth Bass
White Crappie
Black Crappie
Yellow Perch
Walleye
Pallid Sturgeon
Shovelnose Sturgeon
Paddlefish
Shortnose Gar
Goldeye
Lake Chub
Western Silvery Minnow
Brassy Minnow
Plains Minnow
Emerald Shiner
Sand Shiner
Northern Redbelly Dace
Northern Redbelly X Finescale Dace
Fathead Minnow
Longnose Dace
Creek Chub
Sturgeon Chub
Sicklefin Chub
Pearl Dace
Flathead Chub
River Carpsucker
Blue Sucker
Smallmouth Buffalo
Bigmouth Buffalo
Shorthead Redhorse
Channel Catfish
Stonecat
Brook Stickleback
Iowa Darter
Sauger

Freshwater Drum
Little Brown Myotis
Yuma Myotis
Long-eared Myotis
Fringed Myotis
Long-legged Myotis
California Myotis
Western Small-footed Myotis
Northern Myotis
Silver-haired Bat
Big Brown Bat
Eastern Red Bat
Hoary Bat
Spotted Bat
Townsend's Big-eared Bat
Pallid Bat
Black Bear
Grizzly Bear
Mountain Lion
Wapiti Or Elk
Mule Deer
White-tailed Deer
Moose
Caribou
Pronghorn
American Bison
Mountain Goat
Bighorn Sheep
Feral Horse
American Beaver
Gray Wolf
Swift Fox
American Marten
Fisher
Black-footed Ferret
Mink
Wolverine
American Badger
Western Spotted Skunk
Striped Skunk
Northern River Otter
Lynx
Bobcat
Coyote
Red Fox
Common Raccoon

Ermine
Least Weasel
Long-tailed Weasel
Masked Shrew
Preble's Shrew
Vagrant Shrew
Dusky Or Montane Shrew
Dwarf Shrew
Water Shrew
Arctic Shrew
Merriam's Shrew
Pygmy Shrew
Hayden's Shrew
Northern Short-tailed Shrew
American Pika
Eastern Cottontail
Mountain Cottontail
Desert Cottontail
Snowshoe Hare
White-tailed Jackrabbit
Black-tailed Jackrabbit
Pygmy Rabbit
Least Chipmunk
Yellow-pine Chipmunk
Red-tailed Chipmunk
Uinta Chipmunk
Yellow-bellied Marmot
Hoary Marmot
Richardson's Ground Squirrel
Uinta Ground Squirrel
Columbian Ground Squirrel
Thirteen-lined Ground Squirrel
Franklin's Ground Squirrel
Golden-mantled Ground Squirrel
Wyoming Ground Squirrel
Townsend's Ground Squirrel
Black-tailed Prairie Dog
White-tailed Prairie Dog
Eastern Gray Squirrel
Eastern Fox Squirrel
Red Squirrel
Northern Flying Squirrel
Northern Pocket Gopher
Idaho Pocket Gopher
Olive-backed Pocket Mouse
Plains Pocket Mouse

Great Basin Pocket Mouse
Ord's Kangaroo Rat
Hispid Pocket Mouse
Western Harvest Mouse
Deer Mouse
White-footed Mouse
Northern Grasshopper Mouse
Bushy-tailed Woodrat
Southern Red-backed Vole
Heather Vole
Meadow Vole
Montane Vole
Long-tailed Vole
Prairie Vole
Water Vole
Sagebrush Vole
Muskrat
Northern Bog Lemming
Norway Rat
House Mouse
Meadow Jumping Mouse
Western Jumping Mouse
Common Porcupine
Snapping Turtle
Painted Turtle
Spiny Softshell
Northern Alligator Lizard
Short-horned Lizard
Sagebrush Lizard
Western Skink
Rubber Boa
Racer
Western Hognose Snake
Milk Snake
Gopher Snake
Western Terrestrial Garter Snake
Plains Garter Snake
Common Garter Snake
Smooth Green Snake
Western Rattlesnake
Calico Crayfish
Virile Crayfish
A Crayfish
Signal Crayfish
Fatmucket
White Heelsplitter

Black Sandshell
Western Pearlshell
Giant Floater

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Table 3. Species Tier Assignments

This list is subject to change as information and understanding increases for each species biological needs.

Species	Management Plan	Alternate Funding	Current Effort	"S" Rank	Limited MT Range	Local Threats	Incidental / Peripheral	Non-Native	Tier
Coeur D'Alene Salamander	0	0	0	2					1
Boreal Toad	0	0	1	3					1
Northern Leopard Frog	0	0	1	3	1	1			1
Common Loon	1	1	2	2		1			1
Trumpeter Swan	1	0	2	2		1			1
Harlequin Duck	1	0	1	2					1
Bald Eagle	1	1	2	3					1
Sage-grouse	1	0	2	4		1			1
Columbian Sharp-tailed Grouse	0	0	1	4					1
Yellow Rail	0	0	0	1					1
Whooping Crane	1	0	2	1	1				1
Piping Plover	1	0	2	2		1			1
Mountain Plover	0	0	2	2					1
Long-billed Curlew	0	0	0	4		1			1
Least Tern	1	0	0	1					1
Black Tern	0	0	0	3		1			1
Flammulated Owl	0	0	0	3					1
Burrowing Owl	0	0	1	3		1			1
Black-backed Woodpecker	0	0	2	3		1			1
Olive-sided Flycatcher	0	0	1	3					1
Sedge Wren	0	0	1	1					1
Nelson's Sharp-tailed Sparrow	0	0	1	1					1
White Sturgeon	0	0	1	1					1
Pallid Sturgeon	1	1	2	1					1
Paddlefish	1	0	1	1					1
Shortnose Gar	0	0	1	1	1	1			1
Yellowstone Cutthroat Trout	1	1	2	2		1			1
Westslope Cutthroat Trout	1	1	2	2		1			1
Columbia Basin Redband Trout	0	0	1	1					1
Bull Trout	1	1	2	2		1			1

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Lake Trout (native lakes)	0	0	1	2			1
Arctic Grayling	1	1	2	1		1	1
Sturgeon Chub	0	0	1	2			1
Sicklefin Chub	0	0	1	1			1
Pearl Dace	0	0	1	2			1
Blue Sucker	0	0	1	2			1
Trout-perch	0	0	1	2	1		1
Burbot	0	0	1	3		1	1
Sauger	0	0	1	2			1
Spotted Bat	0	0	1	1			1
Townsend's Big-eared Bat	1	0	1	2			1
Pallid Bat	0	0	1	1			1
Pygmy Rabbit	0	0	0	3	1	1	1
Hoary Marmot	0	0	0	4		1	1
Black-tailed Prairie Dog	1	0	2	3		1	1
White-tailed Prairie Dog	1	0	2	1			1
Great Basin Pocket Mouse	0	0	0	2	1		1
Northern Bog Lemming	0	0	0	2			1
Meadow Jumping Mouse	0	0	1	2			1
Gray Wolf	1	1	2	3			1
Grizzly Bear	1	1	2	3		1	1
Black-footed Ferret	1	2	2	1			1
Lynx	1	0	2	3		1	1
American Bison	1	0	2	2	1		1
Snapping Turtle	0	0	0	3			1
Spiny Softshell	0	0	0	3		1	1
Western Hognose Snake	0	0	0	3		1	1
Milk Snake	0	0	0	2			1
Smooth Green Snake	0	0	0	2			1
Western Pearlshell	0	0	0	3			1
Long-toed Salamander	0	0	0	5			2
Tiger Salamander	0	0	0	5		1	2
Tailed Frog	0	0	1	4			2
Great Plains Toad	0	0	1	3			2
Woodhouse's Toad	0	0	1	4			2
Pacific Treefrog	0	0	1	4			2
Plains Spadefoot	0	0	1	3			2
Columbia Spotted Frog	0	0	1	4			2
Horned Grebe	0	0	0	4			2
Red-necked Grebe	0	0	0	4			2
Western Grebe	0	0	0	4			2
American Bittern	0	0	0	4			2
Black-crowned Night-heron	0	0	0	3			2
White-faced Ibis	0	0	0	1			2
Canvasback	1	0	1	5			2
Redhead	1	0	1	5			2

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Hooded Merganser	1	0	1	4			2
Turkey Vulture	0	0	1	4			2
Northern Harrier	0	0	1	4			2
Sharp-shinned Hawk	0	0	1	4			2
Cooper's Hawk	0	0	1	4			2
Northern Goshawk	0	0	1	3			2
Swainson's Hawk	0	0	1	4			2
Ferruginous Hawk	0	0	1	3			2
Golden Eagle	1	0	0	4			2
Merlin	0	0	1	4			2
Peregrine Falcon	0	0	2	2			2
Prairie Falcon	0	0	1	4			2
Blue Grouse	0	0	1	5	1		2
White-tailed Ptarmigan	0	0	0	3			2
Greater Sandhill Crane	1	0	2	2			2
Upland Sandpiper	0	0	0	4			2
Marbled Godwit	0	0	0	4			2
Franklin's Gull	0	0	0	3			2
Caspian Tern	0	0	0	2	1		2
Common Tern	0	0	0	3			2
Forster's Tern	0	0	0	2	1		2
Black-billed Cuckoo	0	0	0	4			2
Yellow-billed Cuckoo	0	0	0	3			2
Barn Owl	0	0	0	1	1		2
Northern Hawk Owl	0	0	0	1	1		2
Northern Pygmy-owl	0	0	0	4			2
Barred Owl	0	0	0	4			2
Great Gray Owl	0	0	0	3			2
Boreal Owl	0	0	0	4			2
Northern Saw-whet Owl	0	0	0	4			2
Black Swift	0	0	0	3			2
Vaux's Swift	0	0	0	4			2
Black-chinned Hummingbird	0	0	0	4			2
Broad-tailed Hummingbird	0	0	0	1	1		2
Lewis' Woodpecker	0	0	1	3		1	2
Red-headed Woodpecker	0	0	1	3			2
Williamson's Sapsucker	0	0	1	4			2
Three-toed Woodpecker	0	0	1	4			2
Pileated Woodpecker	0	0	1	4			2
Alder Flycatcher	0	0	1	1	1		2
Hammond's Flycatcher	0	0	1	4			2
Cassin's Kingbird	0	0	1	2	1		2
Pinyon Jay	0	0	1	4			2
Boreal Chickadee	0	0	1	1	1		2
Chestnut-backed Chickadee	0	0	1	4			2
White-breasted Nuthatch	0	0	1	4			2

DRAFT WORKING DOCUMENT DO NOT DUPLICATE

Pygmy Nuthatch	0	0	1	4			2
Brown Creeper	0	0	1	4			2
Canyon Wren	0	0	1	4			2
Winter Wren	0	0	1	4			2
Blue-gray Gnatcatcher	0	0	1	1	1		2
Eastern Bluebird	0	0	1	2	1		2
Western Bluebird	0	0	1	4			2
Veery	0	0	1	4			2
Sprague's Pipit	0	0	1	3			2
Loggerhead Shrike	0	0	1	4			2
Black-and-white Warbler	0	0	1	2	1		2
American Redstart	0	0	1	5		1	2
Yellow-breasted Chat	0	0	1	5		1	2
Indigo Bunting	0	0	1	2	1		2
Green-tailed Towhee	0	0	1	4			2
Clay-colored Sparrow	0	0	1	4			2
Brewer's Sparrow	0	0	1	4			2
Field Sparrow	0	0	1	4			2
Lark Bunting	0	0	1	4			2
Baird's Sparrow	0	0	1	3			2
Grasshopper Sparrow	0	0	1	4			2
Le Conte's Sparrow	0	0	1	1	1		2
Mccown's Longspur	0	0	1	4			2
Dickcissel	0	0	1	1	1		2
Baltimore Oriole	0	0	1	3			2
Bullock's Oriole	0	0	1	5		1	2
Black Rosy-finch	0	0	1	3			2
Gray-crowned Rosy-finch	0	0	1	3			2
White-winged Crossbill	0	0	1	4			2
Torrent Sculpin	0	0	1	3			2
Spoonhead Sculpin	0	0	1	3			2
Northern Redbelly X Finescale Dace	0	0	1	3			2
Bigmouth Buffalo	0	0	1	4		1	2
Freshwater Drum	0	0	1	4			2
Preble's Shrew	0	0	0	3		1	2
Vagrant Shrew	0	0	0	4			2
Dwarf Shrew	0	0	0	3			2
Arctic Shrew	0	0	0	1			2
Merriam's Shrew	0	0	0	3			2
Pygmy Shrew	0	0	0	3			2
Hayden's Shrew	0	0	0	4			2
Yuma Myotis	0	0	1	4			2
Long-eared Myotis	0	0	1	4			2
Fringed Myotis	0	0	1	3			2
Long-legged Myotis	0	0	1	4			2
California Myotis	0	0	1	4			2

DRAFT WORKING DOCUMENT DO NOT DUPLICATE

Western Small-footed Myotis	0	0	1	4			2
Northern Myotis	0	0	1	4			2
Silver-haired Bat	0	0	1	4			2
Big Brown Bat	0	0	1	4			2
Eastern Red Bat	0	0	1	4			2
Hoary Bat	0	0	1	4			2
Eastern Cottontail	0	0	0	4			2
Mountain Cottontail	0	0	0	4			2
White-tailed Jackrabbit	0	0	0	4			2
Black-tailed Jackrabbit	0	0	0	2			2
Uinta Chipmunk	0	0	0	3			2
Uinta Ground Squirrel	0	0	0	4			2
Wyoming Ground Squirrel	0	0	0	3			2
Northern Flying Squirrel	0	0	0	4			2
Idaho Pocket Gopher	0	0	0	3			2
Olive-backed Pocket Mouse	0	0	0	4			2
Ord's Kangaroo Rat	0	0	0	4			2
Hispid Pocket Mouse	0	0	0	1	1	1	2
White-footed Mouse	0	0	0	4			2
Water Vole	0	0	0	4			2
Sagebrush Vole	0	0	0	4			2
Swift Fox	1	0	2	3			2
American Marten	0	0	1	4		1	2
Fisher	0	0	1	3			2
Least Weasel	0	0	1	4			2
Wolverine	0	0	2	2		1	2
American Badger	0	0	1	4			2
Western Spotted Skunk	0	0	1	1			2
Northern River Otter	0	0	1	4			2
Northern Alligator Lizard	0	0	0	3			2
Short-horned Lizard	0	0	0	3			2
Sagebrush Lizard	0	0	0	3			2
Western Skink	0	0	0	3			2
Rubber Boa	0	0	0	4			2
Common Garter Snake	0	0	0	4			2
Western Rattlesnake	0	0	0	4			2
Black Sandshell	0	0	0	5			2
Boreal Chorus Frog	0	0	1	5			3
Great Basin Spadefoot	0	0	1	5			3
Pied-billed Grebe	0	0	0	5			3
Eared Grebe	0	0	0	5			3
Clark's Grebe	0	0	0	5			3
American White Pelican	0	0	1	3			3
Double-crested Cormorant	0	0	0	5			3
Great Blue Heron	0	0	0	5			3
Snowy Egret	0	0	0	5			3

DRAFT WORKING DOCUMENT DO NOT DUPLICATE

Cattle Egret	0	0	0	5	3
Tundra Swan	0	0	1	5	3
Greater White-fronted Goose	0	0	1	5	3
Snow Goose	1	0	1	4	3
Ross' Goose	1	0	1	4	3
Canada Goose	0	0	1	5	3
Wood Duck	1	0	1	5	3
Green-winged Teal	1	0	1	5	3
American Black Duck	1	0	1	5	3
Mallard	1	0	1	5	3
Northern Pintail	1	0	1	5	3
Blue-winged Teal	1	0	1	5	3
Cinnamon Teal	1	0	1	5	3
Northern Shoveler	1	0	1	5	3
Gadwall	1	0	1	5	3
American Wigeon	1	0	1	5	3
Ring-necked Duck	1	0	1	5	3
Greater Scaup	1	0	1	5	3
Lesser Scaup	1	0	1	5	3
Long Tailed Duck	1	0	1	5	3
White-winged Scoter	1	0	1	5	3
Common Goldeneye	1	0	1	5	3
Barrow's Goldeneye	1	0	1	5	3
Bufflehead	1	0	1	5	3
Common Merganser	1	0	1	5	3
Red-breasted Merganser	1	0	1	5	3
Ruddy Duck	1	0	1	5	3
Osprey	0	0	1	5	3
Red-tailed Hawk	0	0	1	5	3
Rough-legged Hawk	0	0	1	5	3
American Kestrel	0	0	1	5	3
Gyr Falcon	0	0	1	5	3
Spruce Grouse	0	0	1	4	3
Ruffed Grouse	0	0	1	5	3
Sharp-tailed Grouse	0	0	1	4	3
Virginia Rail	0	0	0	5	3
Sora	0	0	0	5	3
American Coot	0	0	0	5	3
Lesser Sandhill Crane	1	0	2	2	3
Killdeer	0	0	0	5	3
Black-necked Stilt	0	0	0	5	3
American Avocet	0	0	0	5	3
Greater Yellowlegs	0	0	0	5	3
Lesser Yellowlegs	0	0	0	5	3
Solitary Sandpiper	0	0	0	5	3
Willet	0	0	0	5	3

DRAFT WORKING DOCUMENT DO NOT DUPLICATE

Spotted Sandpiper	0	0	0	5		3
Semipalmated Sandpiper	0	0	0	5		3
Western Sandpiper	0	0	0	5		3
Least Sandpiper	0	0	0	5		3
White-rumped Sandpiper	0	0	0	5		3
Baird's Sandpiper	0	0	0	5		3
Pectoral Sandpiper	0	0	0	5		3
Dunlin	0	0	0	5		3
Long-billed Dowitcher	0	0	0	5		3
Common Snipe	0	0	0	5		3
Wilson's Phalarope	0	0	0	5		3
Red-necked Phalarope	0	0	0	5	1	3
Ring-billed Gull	0	0	0	5		3
California Gull	0	0	0	5		3
Herring Gull	0	0	0	5		3
Glaucous-winged Gull	0	0	0	5		3
Glaucous Gull	0	0	0	5		3
Arctic Tern	0	0	0	5		3
Mourning Dove	0	0	0	5		3
Eastern Screech-owl	0	0	0	5		3
Western Screech-owl	0	0	0	5		3
Great Horned Owl	0	0	0	5		3
Snowy Owl	0	0	0	5		3
Long-eared Owl	0	0	0	5		3
Short-eared Owl	0	0	0	5		3
Common Nighthawk	0	0	0	5		3
Common Poorwill	0	0	0	5		3
Chimney Swift	0	0	0	5		3
White-throated Swift	0	0	0	5		3
Calliope Hummingbird	0	0	0	5		3
Rufous Hummingbird	0	0	0	5		3
Belted Kingfisher	0	0	0	5		3
Red-naped Sapsucker	0	0	1	5		3
Downy Woodpecker	0	0	1	5		3
Hairy Woodpecker	0	0	1	5		3
Northern Flicker	0	0	1	5		3
Western Wood-pewee	0	0	1	5		3
Willow Flycatcher	0	0	1	5		3
Least Flycatcher	0	0	1	5		3
Dusky Flycatcher	0	0	1	5		3
Cordilleran Flycatcher	0	0	1	5		3
Say's Phoebe	0	0	1	5		3
Western Kingbird	0	0	1	5		3
Eastern Kingbird	0	0	1	5		3
Horned Lark	0	0	1	5		3
Purple Martin	0	0	1	5		3

DRAFT WORKING DOCUMENT DO NOT DUPLICATE

Tree Swallow	0	0	1	5	3
Violet-green Swallow	0	0	1	5	3
Northern Rough-winged Swallow	0	0	1	5	3
Bank Swallow	0	0	1	5	3
Cliff Swallow	0	0	1	5	3
Barn Swallow	0	0	1	5	3
Gray Jay	0	0	1	5	3
Steller's Jay	0	0	1	5	3
Blue Jay	0	0	1	5	3
Clark's Nutcracker	0	0	1	5	3
Black-billed Magpie	0	0	1	5	3
American Crow	0	0	1	5	3
Common Raven	0	0	1	5	3
Black-capped Chickadee	0	0	1	5	3
Mountain Chickadee	0	0	1	5	3
Red-breasted Nuthatch	0	0	1	5	3
Rock Wren	0	0	1	5	3
House Wren	0	0	1	5	3
Marsh Wren	0	0	1	5	3
American Dipper	0	0	1	5	3
Golden-crowned Kinglet	0	0	1	5	3
Ruby-crowned Kinglet	0	0	1	5	3
Mountain Bluebird	0	0	1	5	3
Townsend's Solitaire	0	0	1	5	3
Swainson's Thrush	0	0	1	5	3
Hermit Thrush	0	0	1	5	3
American Robin	0	0	1	5	3
Varied Thrush	0	0	1	5	3
Gray Catbird	0	0	1	5	3
Northern Mockingbird	0	0	1	5	3
Sage Thrasher	0	0	1	5	3
Brown Thrasher	0	0	1	5	3
American Pipit	0	0	1	5	3
Bohemian Waxwing	0	0	1	5	3
Cedar Waxwing	0	0	1	5	3
Northern Shrike	0	0	1	5	3
Warbling Vireo	0	0	1	5	3
Red-eyed Vireo	0	0	1	5	3
Cassin's Vireo	0	0	1	5	3
Tennessee Warbler	0	0	1	5	3
Orange-crowned Warbler	0	0	1	5	3
Nashville Warbler	0	0	1	5	3
Yellow Warbler	0	0	1	5	3
Black-throated Blue Warbler	0	0	1	5	3
Yellow-rumped Warbler	0	0	1	5	3
Black-throated Gray Warbler	0	0	1	5	3

DRAFT WORKING DOCUMENT DO NOT DUPLICATE

Townsend's Warbler	0	0	1	5	3
Ovenbird	0	0	1	5	3
Northern Waterthrush	0	0	1	5	3
Macgillivray's Warbler	0	0	1	5	3
Common Yellowthroat	0	0	1	5	3
Wilson's Warbler	0	0	1	5	3
Western Tanager	0	0	1	5	3
Black-headed Grosbeak	0	0	1	5	3
Lazuli Bunting	0	0	1	5	3
Spotted Towhee	0	0	1	5	3
American Tree Sparrow	0	0	1	5	3
Chipping Sparrow	0	0	1	5	3
Vesper Sparrow	0	0	1	5	3
Lark Sparrow	0	0	1	5	3
Sage Sparrow	0	0	1	5	3
Savannah Sparrow	0	0	1	5	3
Fox Sparrow	0	0	1	5	3
Song Sparrow	0	0	1	5	3
Lincoln's Sparrow	0	0	1	5	3
Swamp Sparrow	0	0	1	5	3
White-throated Sparrow	0	0	1	5	3
White-crowned Sparrow	0	0	1	5	3
Harris' Sparrow	0	0	1	5	3
Dark-eyed Junco	0	0	1	5	3
Lapland Longspur	0	0	1	5	3
Chestnut-collared Longspur	0	0	1	5	3
Snow Bunting	0	0	1	5	3
Bobolink	0	0	1	5	3
Red-winged Blackbird	0	0	1	5	3
Western Meadowlark	0	0	1	5	3
Yellow-headed Blackbird	0	0	1	5	3
Rusty Blackbird	0	0	1	5	3
Brewer's Blackbird	0	0	1	5	3
Common Grackle	0	0	1	5	3
Brown-headed Cowbird	0	0	1	5	3
Orchard Oriole	0	0	1	5	3
Pine Grosbeak	0	0	1	5	3
Purple Finch	0	0	1	5	3
Cassin's Finch	0	0	1	5	3
House Finch	0	0	1	5	3
Red Crossbill	0	0	1	5	3
Common Redpoll	0	0	1	5	3
Hoary Redpoll	0	0	1	5	3
Pine Siskin	0	0	1	5	3
American Goldfinch	0	0	1	5	3
Evening Grosbeak	0	0	1	5	3

DRAFT WORKING DOCUMENT DO NOT DUPLICATE

Mottled Sculpin	0	0	1	5		3
Slimy Sculpin	0	0	1	5		3
Shovelnose Sturgeon	0	0	1	4		3
Goldeye	0	0	1	5		3
Lake Whitefish	0	0	1	4		3
Pygmy Whitefish	0	0	1	5		3
Mountain Whitefish	0	0	1	5		3
Lake Chub	0	0	1	5		3
Western Silvery Minnow	0	0	1	4		3
Brassy Minnow	0	0	1	5		3
Plains Minnow	0	0	1	5	1	3
Peamouth	0	0		5		3
Emerald Shiner	0	0	1	5		3
Sand Shiner	0	0	1	4		3
Northern Redbelly Dace	0	0	1	5	1	3
Fathead Minnow	0	0	1	4		3
Northern Pikeminnow	0	0	1	5		3
Longnose Dace	0	0	1	5		3
Redside Shiner	0	0	1	5		3
Creek Chub	0	0	1	5		3
Flathead Chub	0	0	1	5		3
River Carpsucker	0	0	1	5		3
Longnose Sucker	0	0	1	5		3
White Sucker	0	0	1	5		3
Largescale Sucker	0	0	1	5		3
Mountain Sucker	0	0	1	5	1	3
Smallmouth Buffalo	0	0	1	5	1	3
Shorthead Redhorse	0	0	1	5		3
Channel Catfish	0	0	1	5		3
Stonecat	0	0	1	5		3
Brook Stickleback	0	0	1	5		3
Iowa Darter	0	0	1	5		3
Masked Shrew	0	0	0	5		3
Dusky Or Montane Shrew	0	0	0	5		3
Water Shrew	0	0	0	5		3
Little Brown Myotis	0	0	1	5		3
American Pika	0	0	0	5		3
Desert Cottontail	0	0	0	5		3
Snowshoe Hare	0	0	0	5		3
Least Chipmunk	0	0	0	5		3
Yellow-pine Chipmunk	0	0	0	5		3
Red-tailed Chipmunk	0	0	0	5		3
Yellow-bellied Marmot	0	0	0	5		3
Richardson's Ground Squirrel	0	0	0	5		3
Columbian Ground Squirrel	0	0	0	5		3
Thirteen-lined Ground Squirrel	0	0	0	5		3

DRAFT WORKING DOCUMENT DO NOT DUPLICATE

Franklin's Ground Squirrel	0	0	0	5			3
Golden-mantled Ground Squirrel	0	0	0	5			3
Townsend's Ground Squirrel	0	0	0	5			3
Eastern Fox Squirrel	0	0	0	5			3
Red Squirrel	0	0	0	5			3
Northern Pocket Gopher	0	0	0	5			3
American Beaver	0	0	0	5			3
Western Harvest Mouse	0	0	0	5			3
Deer Mouse	0	0	0	5			3
Northern Grasshopper Mouse	0	0	0	5			3
Bushy-tailed Woodrat	0	0	0	5			3
Southern Red-backed Vole	0	0	0	5			3
Heather Vole	0	0	0	5			3
Meadow Vole	0	0	0	5			3
Montane Vole	0	0	0	5			3
Long-tailed Vole	0	0	0	5			3
Prairie Vole	0	0	0	5			3
Muskrat	0	0	0	5			3
Western Jumping Mouse	0	0	0	5			3
Common Porcupine	0	0	0	5			3
Coyote	0	0	1	5			3
Red Fox	0	0	1	5			3
Black Bear	1	0	1	5			3
Ermine	0	0	1	5			3
Long-tailed Weasel	0	0	1	5			3
Mink	0	0	1	5			3
Striped Skunk	0	0	1	5			3
Bobcat	0	0	1	5			3
Mountain Lion	1	0	2	4			3
Wapiti Or Elk	1	0	2	5			3
Mule Deer	1	0	2	5			3
White-tailed Deer	0	0	2	5			3
Moose	0	0	2	5			3
Pronghorn	1	0	2	5			3
Mountain Goat	1	0	1	5			3
Bighorn Sheep	1	0	1	4	1	1	3
Painted Turtle	0	0	0	5			3
Racer	0	0	0	5			3
Gopher Snake	0	0	0	5			3
Western Terrestrial Garter Snake	0	0	0	5			3
Plains Garter Snake	0	0	0	5			3
Calico Crayfish	0	0	0	5			3
Virile Crayfish	0	0	0	4			3
A Crayfish	0	0	0	4			3
Signal Crayfish	0	0	0	5			3
Fatmucket	0	0	0	5			3

DRAFT WORKING DOCUMENT DO NOT DUPLICATE

Giant Floater	0	0	0	5			3
Roughskin Newt	0	0	0	5		1	4
Idaho Giant Salamander	0	0	0	5	1		4
Canadian Toad	0	0	1	5	1		4
Bullfrog	0	0	1	5		1	4
Wood Frog	0	0	1	5			4
Red-throated Loon	0	0	0	5	1		4
Pacific Loon	0	0	0	5	1		4
Yellow-billed Loon	0	0	0	5	1		4
Least Bittern	0	0	0	5	1		4
Great Egret	0	0	0	5	1		4
Little Blue Heron	0	0	0	5	1		4
Green Heron	0	0	0	5	1		4
Yellow-crowned Night-heron	0	0	0	5	1		4
Wood Stork	0	0	0	5	1		4
Mute Swan	0	0	1	5		1	4
Brant	0	0	1	5	1		4
Garganey	0	0	1	5	1		4
Eurasian Wigeon	0	0	1	5	1		4
Black Scoter	0	0	1	5	1		4
Surf Scoter	0	0	1	5	1		4
Red-shouldered Hawk	0	0	1	5	1		4
Broad-winged Hawk	0	0	1	5	1		4
Gray Partridge	0	0	1	5		1	4
Chukar	0	0	1	5		1	4
Ring-necked Pheasant	0	0	1	5		1	4
Willow Ptarmigan	0	0	0	5	1		4
Wild Turkey	0	0	1	5		1	4
Common Moorhen	0	0	0	5	1		4
Black-bellied Plover	0	0	0	5	1		4
American Golden-plover	0	0	0	5	1		4
Snowy Plover	0	0	0	5	1		4
Semipalmated Plover	0	0	0	5	1		4
Whimbrel	0	0	0	5	1		4
Hudsonian Godwit	0	0	0	5	1		4
Ruddy Turnstone	0	0	0	5	1		4
Black Turnstone	0	0	0	5	1		4
Red Knot	0	0	0	5	1		4
Sanderling	0	0	0	5	1		4
Curlew Sandpiper	0	0	0	5	1		4
Stilt Sandpiper	0	0	0	5	1		4
Buff-breasted Sandpiper	0	0	0	5	1		4
Short-billed Dowitcher	0	0	0	5	1		4
American Woodcock	0	0	0	5	1		4
Red Phalarope	0	0	0	5	1		4
Pomarine Jaeger	0	0	0	5	1		4

DRAFT WORKING DOCUMENT DO NOT DUPLICATE

Parasitic Jaeger	0	0	0	5	1	4
Long-tailed Jaeger	0	0	0	5	1	4
Laughing Gull	0	0	0	5	1	4
Bonaparte's Gull	0	0	0	5	1	4
Mew Gull	0	0	0	5	1	4
Thayer's Gull	0	0	0	5	1	4
Great Black-backed Gull	0	0	0	5	1	4
Black-legged Kittiwake	0	0	0	5	1	4
Sabine's Gull	0	0	0	5	1	4
Ivory Gull	0	0	0	5	1	4
Marbled Murrelet	0	0	0	5	1	4
Ancient Murrelet	0	0	0	5	1	4
Rock Dove	0	0	0	5		1 4
Band-tailed Pigeon	0	0	0	5	1	4
Eurasian Collared-dove	0	0	0	5	1	4
White-winged Dove	0	0	0	5	1	4
Whip-poor-will	0	0	0	5	1	4
Anna's Hummingbird	0	0	0	5	1	4
Ruby-throated Hummingbird	0	0	0	5	1	4
Red-bellied Woodpecker	0	0	1	5	1	4
Yellow-bellied Sapsucker	0	0	1	5	1	4
White-headed Woodpecker	0	0	1	5	1	4
Eastern Wood-pewee	0	0	1	5	1	4
Yellow-bellied Flycatcher	0	0	1	5	1	4
Eastern Phoebe	0	0	1	5	1	4
Ash-throated Flycatcher	0	0	1	5	1	4
Great Crested Flycatcher	0	0	1	5	1	4
Scissor-tailed Flycatcher	0	0	1	5	1	4
Bewick's Wren	0	0	1	5	1	4
Gray-cheeked Thrush	0	0	1	5	1	4
Wood Thrush	0	0	1	5	1	4
European Starling	0	0	1	5		1 4
Philadelphia Vireo	0	0	1	5	1	4
Golden-winged Warbler	0	0	1	5	1	4
Northern Parula	0	0	1	5	1	4
Chestnut-sided Warbler	0	0	1	5	1	4
Magnolia Warbler	0	0	1	5	1	4
Cape May Warbler	0	0	1	5	1	4
Black-throated Green Warbler	0	0	1	5	1	4
Blackburnian Warbler	0	0	1	5	1	4
Yellow-throated Warbler	0	0	1	5	1	4
Pine Warbler	0	0	1	5	1	4
Prairie Warbler	0	0	1	5	1	4
Palm Warbler	0	0	1	5	1	4
Bay-breasted Warbler	0	0	1	5	1	4
Blackpoll Warbler	0	0	1	5	1	4

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Prothonotary Warbler	0	0	1	5	1	4
Kentucky Warbler	0	0	1	5	1	4
Connecticut Warbler	0	0	1	5	1	4
Mourning Warbler	0	0	1	5	1	4
Hooded Warbler	0	0	1	5	1	4
Canada Warbler	0	0	1	5	1	4
Painted Redstart	0	0	1	5	1	4
Summer Tanager	0	0	1	5	1	4
Scarlet Tanager	0	0	1	5	1	4
Northern Cardinal	0	0	1	5	1	4
Brambling	0	0	1	5		4
Rose-breasted Grosbeak	0	0	1	5	1	4
Painted Bunting	0	0	1	5	1	4
Black-throated Sparrow	0	0	1	5	1	4
Golden-crowned Sparrow	0	0	1	5	1	4
Smith's Longspur	0	0	1	5	1	4
Great-tailed Grackle	0	0	1	5	1	4
Hooded Oriole	0	0	1	5	1	4
Lesser Goldfinch	0	0	1	5	1	4
House Sparrow	0	0	1	5		1 4
Cisco	0	0	1	5		1 4
Kokanee Salmon	0	0	1	5		1 4
Chinook Salmon	0	0	1	5		1 4
Rainbow Trout	0	0	1	5		1 4
Golden Trout	0	0	1	5		1 4
Brown Trout	0	0	1	5		1 4
Brook Trout	0	0	1	5		1 4
Rainbow Smelt	0	0	1	5		1 4
Northern Pike	0	0	1	5		1 4
Goldfish	0	0	1	5		1 4
Common Carp	0	0	1	5		1 4
Utah Chub	0	0	1	5		1 4
Golden Shiner	0	0	1	5		1 4
Spottail Shiner	0	0	1	5		1 4
Black Bullhead	0	0	1	5		1 4
Yellow Bullhead	0	0	1	5		1 4
Plains Killifish	0	0	1	4		1 4
Western Mosquitofish	0	0	1	5		1 4
Sailfin Molly	0	0	1	5		1 4
Shortfin Molly	0	0	1	5		1 4
Green Swordtail	0	0	1	5		1 4
Variable Platyfish	0	0	1	5		1 4
White Bass	0	0	1	5		1 4
Rock Bass	0	0	1	5		1 4
Green Sunfish	0	0	1	5		1 4
Pumpkinseed	0	0	1	5		1 4

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Bluegill	0	0	1	5			1	4
Smallmouth Bass	0	0	1	5			1	4
Largemouth Bass	0	0	1	5			1	4
White Crappie	0	0	1	5			1	4
Black Crappie	0	0	1	5			1	4
Yellow Perch	0	0	1	5			1	4
Walleye	0	0	1	5			1	4
Northern Short-tailed Shrew	0	0	0	5		1		4
Eastern Gray Squirrel	0	0	0	5			1	4
Plains Pocket Mouse	0	0	0	5		1		4
Norway Rat	0	0	0	5			1	4
House Mouse	0	0	0	5			1	4
Common Raccoon	0	0	1	5			1	4
Caribou	0	0	0	5	1	1	1	4
Feral Horse	0	0	0	5			1	4
White Heelsplitter	0	0	0	5			1	4

Table 4. Terrestrial Communities Tiers

Community / Habitat	Tier
Grassland Complexes	1
Mixed Broadleaf Forests	1
Mixed Shrub/Grass Associations	1
Riparian & Wetlands	1
Sagebrush & Salt Flats	1
Alpine Meadows	2
Altered Herbaceous	2
Badlands	2
Douglas Fir	2
Low Density Xeric Forest	2
Mixed Mesic Forest	2
Mixed Mesic Shrubs	2
Mixed Whitebark Pine Forests	2
Ponderosa Pine	2
Western Red Cedar	2
Western Larch	2
Standing Burnt Forest	2
Rocky Mountain Juniper	2
Snowfields Or Ice	2
Agricultural Lands - Dry	3
Agricultural Lands - Irrigated	3
Douglas-fir/ Lodgepole Pine	3
Grand Fir	3

Limber Pine	3
Lodgepole Pine	3
Mines, Quarries, Gravel Pits	3
Missouri Breaks	3
Mixed Barren Sites	3
Mixed Broadleaf and Conifer Forest	3
Mixed Subalpine Forest	3
Mixed Xeric Forest	3
Montane Parklands & Subalpine Meadows	3
Rock	3
Utah Juniper	3
Western Hemlock	3
Cloud Shadows	4
Clouds	4
Urban	4
Water	4

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Table 5. Aquatic Community Tiers

Community	Tier
Mountain Streams	1
Prairie Streams	1
Intermountain Valley Rivers	2
Intermountain Valley Streams	2
Mixed Source Rivers (Intermountain and Prairie Flow)	2
Prairie Rivers	2
Lowland Lakes	3
Lowland Reservoirs	3
Mountain Lakes	3
Mountain Reservoirs	3

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Table 6. Terrestrial Focus Area Rankings based on USFS Subsections

USFS Subsection	Ecotype	Tier
Bitterroot/Frenchtown Valleys	Intermountain/foothill grassland	1
Central Montana Broad Valleys	Intermountain/foothill grassland	1
Deerlodge Valley	Intermountain/foothill grassland	1
Flathead River Valley	Intermountain/foothill grassland	1
Little Belt Foothills	Intermountain/foothill grassland	1
North Tobacco Root Mountains and	Intermountain/foothill grassland	1

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Foothills		
Rocky Mountain Front Foothills	Intermountain/foothill grassland	1
South Elkhorn Mountains	Intermountain/foothill grassland	1
Southwest Montana Intermontane Basins and Valleys	Intermountain/foothill grassland	1
Upper Yellowstone Valley	Intermountain/foothill grassland	1
Mission/Swan Valley and Mountains	Montane Forest	1
Missouri Coteau	Plains Grassland & Plains Forest	1
Montana Sedimentary Plains	Plains Grassland & Plains Forest	1
Bighorn Intermontane Basin	Shrub Grassland	1
Montana Glaciated Plains	Shrub Grassland	1
Montana Shale Plains	Shrub Grassland	1
Powder River Basin/Breaks/Scoria Hills	Shrub Grassland	1
Shale Scablands	Shrub Grassland	1
Avon/Nevada Valleys	Intermountain/foothill grassland	2
Belt Mountain Foothills	Intermountain/foothill grassland	2
Bighorn Sedimentary Mountains	Intermountain/foothill grassland	2
Flint Creek/Upper Willow Creek Basins	Intermountain/foothill grassland	2
Snowy Foothills	Intermountain/foothill grassland	2
Beartooth Front	Montane Forest	2
Big Belt Foothills	Montane Forest	2
East Pioneer Mountains	Montane Forest	2
Gallatin Foothills/Spanish Peaks	Montane Forest	2
Little Belt/Snowy/Judith/Mountains	Montane Forest	2
Madison Mountains	Montane Forest	2
Ruby/Tobacco Root Mountains	Montane Forest	2
Missouri Plateau	Plains Grassland & Plains Forest	2
Missouri River Breaks	Plains Grassland & Plains Forest	2
Montana High Plains and Foothills	Plains Grassland & Plains Forest	2
Pierre Shale Plains	Plains Grassland & Plains Forest	2
Blacktail Mountains	Shrub Grassland	2
Gravelly/Snowcrest Mountains	Shrub Grassland	2
Montana Isolated Mountain Ranges	Intermountain/foothill grassland	3
Absaroka/Gallatin Mountains	Montane Forest	3
Anaconda Mountains	Montane Forest	3
Anaconda/Flint Creek Mountains	Montane Forest	3
Beartooth Mountains	Montane Forest	3
Beaverhead Mountains	Montane Forest	3
Big Belt Mountains	Montane Forest	3
Bitterroot Glaciated Canyons	Montane Forest	3
Boulder/Elkhorn Mountains	Montane Forest	3
Bridger Mountains and Foothills	Montane Forest	3
Cabinet Mountains	Montane Forest	3
Clark Fork Valley and Mountains	Montane Forest	3

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Coeur d'Alene Mountains	Montane Forest	3
Continental Divide Foothills	Montane Forest	3
Continental Divide Uplands	Montane Forest	3
Crazy Mountains	Montane Forest	3
Flathead Thrust Faulted Mountains	Montane Forest	3
Garnet/Sapphire Mountains	Montane Forest	3
Livingston Mountains	Montane Forest	3
Middle Rocky Mountain Front	Montane Forest	3
North Rocky Mountain Front	Montane Forest	3
Northern Absaroka Volcanic Mountains	Montane Forest	3
Purcell/North Cabinet Mountains	Montane Forest	3
Rattlesnake/Blackfoot/South Swan Mountains	Montane Forest	3
Salish Mountains	Montane Forest	3
South Anaconda/Bitterroot Mountains	Montane Forest	3
South Rocky Mountain Front	Montane Forest	3
Southern Beaverhead Mountains	Montane Forest	3
St.Joe/Bitterroot Mountains	Montane Forest	3
West Pioneer Mountains	Montane Forest	3
West Yellowstone Valley	Montane Forest	3
Whitefish/Swan Mountains	Montane Forest	3
Yellowstone Volcanic Plateau	Montane Forest	3
Wolf Mountains	Plains Grassland & Plains Forest	3

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Table 7. Aquatic Focus Area Rankings based on Fourth Code HUC's

4th Code HUC	Ecotype	Tier
Big Hole	Intermountain/foothill grassland	1
Bitterroot	Intermountain/foothill grassland	1
Blackfoot	Intermountain/foothill grassland	1
Jefferson	Intermountain/foothill grassland	1
Upper Yellowstone & Tributaries	Intermountain/foothill grassland	1
Lower Clark Fork	Montane Forest	1
Middle Clark Fork	Montane Forest	1
Lower Missouri	Plains Grassland & Plains Forest	1
Lower Yellowstone	Plains Grassland & Plains Forest	1
Powder	Plains Grassland & Plains Forest	1
Tongue	Plains Grassland & Plains Forest	1
Middle Missouri & Tributaries	Shrub Grassland	1
Lower Musselshell	Intermountain/foothill grassland	2
Madison	Intermountain/foothill grassland	2
Middle Musselshell	Intermountain/foothill grassland	2
Teton	Intermountain/foothill grassland	2
Upper Musselshell	Intermountain/foothill grassland	2

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Lower Milk	Shrub Grassland	2
Middle Milk	Shrub Grassland	2
Ruby	Shrub Grassland	2
Upper Milk	Shrub Grassland	2
Arrow	Intermountain/foothill grassland	3
Beaverhead	Intermountain/foothill grassland	3
Belt	Intermountain/foothill grassland	3
Boulder	Intermountain/foothill grassland	3
Box Elder	Intermountain/foothill grassland	3
Flathead Lake	Intermountain/foothill grassland	3
Flatwillow	Intermountain/foothill grassland	3
Gallatin	Intermountain/foothill grassland	3
Judith	Intermountain/foothill grassland	3
Lower Flathead	Intermountain/foothill grassland	3
Milk Headwaters	Intermountain/foothill grassland	3
Red Rock	Intermountain/foothill grassland	3
Upper Missouri	Intermountain/foothill grassland	3
Belly	Montane Forest	3
Clarks Fork Yellowstone	Montane Forest	3
Cut Bank	Montane Forest	3
Fisher	Montane Forest	3
Flint - Rock	Montane Forest	3
Lower Kootenai	Montane Forest	3
Middle Fork Flathead	Montane Forest	3
Moyie	Montane Forest	3
North Fork Flathead	Montane Forest	3
Shoshone	Montane Forest	3
Smith	Montane Forest	3
South Fork Flathead	Montane Forest	3
St. Mary	Montane Forest	3
Stillwater in Pend Oreille Catalog	Montane Forest	3
Stillwater in Upper Yellowstone	Montane Forest	3
Swan	Montane Forest	3
Two Medicine	Montane Forest	3
Upper Clark Fork	Montane Forest	3
Upper Kootenai	Montane Forest	3
Yaak	Montane Forest	3
Yellowstone Headwaters	Montane Forest	3
Big Dry	Plains Grassland & Plains Forest	3
Big Muddy	Plains Grassland & Plains Forest	3
Boxelder	Plains Grassland & Plains Forest	3
Brush Lake Closed Basin	Plains Grassland & Plains Forest	3
Little Dry	Plains Grassland & Plains Forest	3
Lower Bighorn	Plains Grassland & Plains Forest	3

Mizpah	Plains Grassland & Plains Forest	3
O'Fallon	Plains Grassland & Plains Forest	3
Poplar	Plains Grassland & Plains Forest	3
Pryor	Plains Grassland & Plains Forest	3
Redwater	Plains Grassland & Plains Forest	3
Rosebud	Plains Grassland & Plains Forest	3
West Fork Poplar	Plains Grassland & Plains Forest	3
Battle	Shrub Grassland	3
Beaver in Little Missouri Catalog	Shrub Grassland	3
Beaver in Milk River Catalog Unit	Shrub Grassland	3
Big Horn Lake	Shrub Grassland	3
Big Porcupine	Shrub Grassland	3
Big Sandy	Shrub Grassland	3
Cottonwood	Shrub Grassland	3
Frenchman	Shrub Grassland	3
Little Bighorn	Shrub Grassland	3
Little Powder	Shrub Grassland	3
Lodge	Shrub Grassland	3
Lower Belle Fourche	Shrub Grassland	3
Marias	Shrub Grassland	3
Middle Little Missouri	Shrub Grassland	3
Peoples	Shrub Grassland	3
Porcupine	Shrub Grassland	3
Rock	Shrub Grassland	3
Sage	Shrub Grassland	3
Upper Little Missouri	Shrub Grassland	3
Whitewater	Shrub Grassland	3
Wild Horse Lake	Shrub Grassland	3
Willow	Shrub Grassland	3

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Table 8. Group Inventory Tier Assignments

Taxonomic Group	Calculated Inventory	Tier	Reasoning
Invertebrate Group	1.00	1	I ¹ , I ⁴ , I ⁶
Crayfish Group	1.00	1	I ¹ , I ⁴ , I ⁶
Mammals, bats group	1.67	1	I ¹ , I ⁴ , I ⁶
Reptiles group	1.71	1	I ¹ , I ⁴ , I ⁶
Mussels group	1.80	1	I ¹ , I ⁴ , I ⁶

Mammals, small group	1.92	1	I ¹ , I ⁴ , I ⁶
Birds, shorebird/waterbird group	2.33	1	I ¹ , I ⁴ , I ⁶ , O ¹
Birds, owls group	2.33	1	I ¹ , I ⁴ , I ⁶ , O ¹
Fish-Prairie group	2.39	1	I ¹ , I ⁴ , I ⁶
Birds, raptors group	2.42	2	I ¹ , I ² , I ³ , I ^M , O ²
Fish-Montane group	2.57	2	I ⁵ , I ^M , O ¹
Mammals, furbearers group	2.57	2	I ¹ , I ³ , I ⁴ , I ^M , O ²
Birds, passerine group	2.68	2	I ⁵ , I ⁷ , I ^M , O ¹
Birds, waterfowl group	2.75	3	I ^M , O ¹
Mammals, predators group	2.83	3	I ¹ , I ⁴ , I ^M , O ²
Amphibians group	2.83	3	I ⁴ , I ⁷ , I ^M , O ¹
Birds, upland game group	2.86	3	I ^M , O ¹
Fish-Non-native group	3.00	3	I ^M , O ²
Mammals, big game group	3.00	3	I ^M , O ²

Table 9. Species Inventory Tier Assignments

Species	Inventory Effort Incidental/Peripheral Calculated Inventory Monitoring Effort Specialized surveys required Inventory Tier						Reasoning
American Bittern	1	1	1	1	2	1	I ¹ , I ⁴ , O ¹
Black-crowned Night-heron	1	1	1	1	2	1	I ¹ , I ⁴ , O ¹
White-faced Ibis	1	1	1	1	2	1	I ¹ , I ⁴ , O ¹
Northern Goshawk	2	2	2	1	1	1	I ¹ , I ⁶ , I ^M
Columbia Sharp-tailed Grouse	1	2	2	1	1	1	I ¹ , I ⁶ , I ^M
Yellow Rail	1	1	1	1	2	1	I ¹ , I ⁴ , I ⁷
Greater Yellowlegs	1	1	1	1	3	1	I ¹ , I ⁴ , I ⁷
Solitary Sandpiper	1	1	1	1	3	1	I ¹ , I ⁴ , I ⁷
Semipalmated Sandpiper	1	1	1	1	3	1	I ¹ , I ⁴ , I ⁷
Western Sandpiper	1	1	1	1	3	1	I ¹ , I ⁴ , I ⁷
Least Sandpiper	1	1	1	1	3	1	I ¹ , I ⁴ , I ⁷
White-rumped Sandpiper	1	1	1	1	3	1	I ¹ , I ⁴ , I ⁷
Baird's Sandpiper	1	1	1	1	3	1	I ¹ , I ⁴ , I ⁷

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Pectoral Sandpiper	1	1	1	1	3	1	I ¹ , I ⁴ , I ⁷
Dunlin	1	1	1	1	3	1	I ¹ , I ⁴ , I ⁷
Long-billed Dowitcher	1	1	1	1	3	1	I ¹ , I ⁴ , I ⁷
Glaucous-winged Gull	1	1	1	1	3	1	I ¹ , I ⁴ , I ⁷
Glaucous Gull	1	1	1	1	3	1	I ¹ , I ⁴ , I ⁷
Arctic Tern	1	1	1	1	3	1	I ¹ , I ⁴ , I ⁷
Black-billed Cuckoo	1	1	1	1	2	1	I ¹ , I ⁴ , O ¹
Yellow-billed Cuckoo	1	1	1	1	2	1	I ¹ , I ⁴ , I ⁷ , O ¹
Barn Owl	1	1	1	1	3	1	I ¹ , I ⁴ , I ⁷ , O ¹
Snowy Owl	1	1	1	1	1	1	I ¹ , I ⁴ , I ⁶ , I ⁷
Northern Hawk Owl	1	1	1	1	1	1	I ¹ , I ⁴ , I ⁶
Common Nighthawk	2	2	2	1	1	1	I ¹ , I ⁴ , I ⁶ , I ^M
Common Poorwill	1	2	2	1	1	1	I ¹ , I ⁴ , I ⁶ , I ^M
Black Swift	1	2	2	1	1	1	I ¹ , I ⁵ , I ⁶ , I ^M , O ¹
Chimney Swift	1	1	1	1	1	1	I ¹ , I ⁴ , I ⁶ , O ¹
White-throated Swift	1	2	2	1	1	1	I ¹ , I ⁴ , I ⁶ , I ⁷ , I ^M
Black-chinned Hummingbird	1	1	1	1	2	1	I ¹ , I ⁴ , O ¹
Anna's Hummingbird	1	1	1	1	3	1	I ¹ , I ⁴ , I ⁶ , I ⁷
Alder Flycatcher	1	2	2	1	1	1	I ¹ , I ⁴ , I ⁶ , I ^M
Purple Martin	1	1	1	1	1	1	I ¹ , I ⁴ , I ⁶ , I ⁷
Canyon Wren	1	2	2	1	1	1	I ¹ , I ⁴ , I ⁶ , I ^M , O ¹
Sedge Wren	1	1	1	1	2	1	I ¹ , I ⁴ , I ⁷
American Dipper	2	2	2	1	1	1	I ¹ , I ² , I ⁴ , I ⁶ , I ^M
Blue-gray Gnatcatcher	1	1	1	1	1	1	I ¹ , I ⁵ , I ⁶ , I ⁷
Eastern Bluebird	1	1	1	1	2	1	I ¹ , I ⁴ , I ⁷
Western Bluebird	1	2	2	1	1	1	I ¹ , I ⁴ , I ⁶ , I ^M
Black-and-white Warbler	1	2	2	1	1	1	I ¹ , I ⁴ , I ⁶ , I ^M , O ¹
Indigo Bunting	1	2	2	1	1	1	I ¹ , I ⁴ , I ⁶ , I ^M , O ¹
Green-tailed Towhee	2	2	2	1	1	1	I ¹ , I ⁴ , I ⁶ , I ^M , O ¹
Field Sparrow	1	2	2	1	1	1	I ¹ , I ⁵ , I ⁶ , I ⁷ , I ^M
Le Conte's Sparrow	1	1	1	1	2	1	I ¹ , I ⁴ , I ⁷
Nelson's Sharp-tailed Sparrow	1	1	1	1	2	1	I ¹ , I ⁴ , I ⁷
Black Rosy-finch	1	1	1	1	2	1	I ¹ , I ⁴ , I ⁷
Torrent Sculpin	1	1	1	2	2	1	I ¹ , I ⁴
Spoonhead Sculpin	1	1	1	2	2	1	I ¹ , I ⁴
Shortnose Gar	1	1	1	2	2	1	I ¹ , I ⁵
Lake Trout (native lakes)	1	2	2	1	1	1	I ¹ , I ⁶ , I ^M , O ²
Western Silvery Minnow	2	2	2	1	1	1	I ¹ , I ⁴ , I ⁶ , I ^M
Brassy Minnow	1	2	2	1	1	1	I ¹ , I ⁴ , I ⁶ , I ^M
Plains Minnow	2	2	2	1	1	1	I ¹ , I ⁴ , I ⁶ , I ^M
Pearl Dace	1	1	1	1	3	1	I ¹ , I ⁴
Trout-perch	1	1	1	2	2	1	I ¹ , I ⁴
Iowa Darter	1	1	1	1	2	1	I ¹ , I ⁴

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Arctic Shrew	1	1	1	1	2	1	I ¹ , I ⁵ , I ⁷
Northern Myotis	1	1	1	1	2	1	I ¹ , I ⁴ , I ⁷
Eastern Red Bat	1	1	1	1	2	1	I ¹ , I ⁴ , I ⁷
Spotted Bat	1	2	2	1	1	1	I ¹ , I ⁴ , I ⁶ , I ^M
Townsend's Big-eared Bat	2	2	2	1	1	1	I ¹ , I ⁴ , I ⁶ , I ^M , O ¹
Pallid Bat	1	1	1	1	2	1	I ¹ , I ⁴ , I ⁷
American Pika	2	2	2	1	1	1	I ¹ , I ⁴ , I ⁶ , I ^M , O ¹
Eastern Cottontail	1	1	1	1	2	1	I ¹ , I ⁴ , I ⁷
Black-tailed Jackrabbit	1	2	2	1	1	1	I ¹ , I ⁵ , I ⁶ , I ^M
Uinta Chipmunk	1	1	1	1	1	1	I ¹ , I ⁵ , I ⁶
Hoary Marmot	2	2	2	1	1	1	I ¹ , I ⁵ , I ⁶ , I ^M , O ¹
Uinta Ground Squirrel	1	2	2	1	1	1	I ¹ , I ⁵ , I ⁶ , I ^M
Wyoming Ground Squirrel	1	2	2	1	1	1	I ¹ , I ⁵ , I ⁶ , I ^M
Northern Flying Squirrel	1	2	2	1	1	1	I ¹ , I ⁵ , I ⁶ , I ^M
Idaho Pocket Gopher	1	2	2	1	1	1	I ¹ , I ⁵ , I ⁶ , I ^M
Hispid Pocket Mouse	1	1	1	1	2	1	I ¹ , I ⁵ , I ⁷
Water Vole	1	2	2	1	1	1	I ¹ , I ⁴ , I ⁶ , I ^M
Sagebrush Vole	1	2	2	1	1	1	I ¹ , I ⁴ , I ⁶ , I ^M
Northern Bog Lemming	1	2	2	1	1	1	I ¹ , I ⁵ , I ⁶ , I ^M , O ¹
Meadow Jumping Mouse	1	2	2	1	1	1	I ¹ , I ⁴ , I ⁶ , I ^M
Common Porcupine	2	2	2	1	1	1	I ¹ , I ² , I ⁴ , I ⁶ , I ^M , O ²
Western Spotted Skunk	1	1	1	1	3	1	I ¹ , I ⁴ , I ⁷ , O ¹ , O ²
Snapping Turtle	1	2	2	1	1	1	I ¹ , I ⁴ , I ⁶ , I ^M
Spiny Softshell	1	2	2	1	1	1	I ¹ , I ⁴ , I ⁶ , I ^M
Northern Alligator Lizard	1	2	2	1	1	1	I ¹ , I ⁴ , I ⁶ , I ^M
Western Skink	1	2	2	1	1	1	I ¹ , I ⁴ , I ⁶ , I ^M
Rubber Boa	2	2	2	1	1	1	I ¹ , I ⁴ , I ⁶ , I ^M
Western Hognose Snake	1	2	2	1	1	1	I ¹ , I ⁴ , I ⁶ , I ^M
Milk Snake	1	2	2	1	1	1	I ¹ , I ⁴ , I ⁶ , I ^M , O ¹
Smooth Green Snake	1	1	1	1	1	1	I ¹ , I ⁵ , I ⁶ , I ⁷
Calico Crayfish	1	2	2	1	1	1	I ¹ , I ⁴ , I ⁶ , I ^M
Virile Crayfish	1	2	2	1	1	1	I ¹ , I ⁴ , I ⁶ , I ^M
A Crayfish	1	2	2	1	1	1	I ¹ , I ⁴ , I ⁶ , I ^M
Signal Crayfish	1	2	2	1	1	1	I ¹ , I ⁴ , I ⁶ , I ^M
Black Sandshell	0	2	1	1	3	1	I ¹ , I ⁴
Western Pearlshell	0	2	1	1	3	1	I ¹ , I ⁴
Pacific Treefrog	2	2	2	2	2	2	I ⁴
Plains Spadefoot	1	2	2	2	1	2	I ¹ , I ⁴
Great Basin Spadefoot	1	2	2	2	1	2	I ¹ , I ⁴
Pied-billed Grebe	1	2	2	1	3	2	I ¹ , I ⁴ , O ¹
Horned Grebe	2	2	2	1	2	2	I ¹ , I ⁴ , I ⁶ , O ¹
Red-necked Grebe	2	2	2	1	2	2	I ¹ , I ⁴ , I ⁶ , O ¹
Eared Grebe	2	2	2	1	2	2	I ¹ , I ⁴ , O ¹

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Western Grebe	2	2	2	1	2	2	I ¹ , I ⁴ , I ⁶ , O ¹
Clark's Grebe	1	2	2	1	2	2	I ¹ , I ⁴ , O ¹
Double-crested Cormorant	2	2	2	1	3	2	I ¹ , I ⁴
Snowy Egret	1	2	2	1	3	2	I ¹ , I ⁴
Cattle Egret	1	2	2	1	3	2	I ¹ , I ⁴
Northern Harrier	2	2	2	2	2	2	I ²
Sharp-shinned Hawk	2	2	2	1	2	2	I ² , I ⁶
Cooper's Hawk	2	2	2	1	2	2	I ² , I ⁶
Swainson's Hawk	2	2	2	2	2	2	I ²
Rough-legged Hawk	2	2	2	1	3	2	I ²
American Kestrel	2	2	2	2	2	2	I ²
Merlin	1	2	2	1	2	2	I ² , I ⁶
Gyr Falcon	1	2	2	1	2	2	I ¹ , I ⁵
Prairie Falcon	2	2	2	1	2	2	I ² , I ⁶
Virginia Rail	1	2	2	1	3	2	I ¹ , I ⁴
Sora	1	2	2	1	3	2	I ¹ , I ⁴
American Coot	2	2	2	1	3	2	I ¹ , I ⁴
Black-necked Stilt	1	2	2	1	3	2	I ¹ , I ⁴
American Avocet	2	2	2	1	3	2	I ¹ , I ⁴
Lesser Yellowlegs	2	2	2	1	3	2	I ¹ , I ⁴
Willet	2	2	2	1	3	2	I ¹ , I ⁴
Spotted Sandpiper	2	2	2	1	3	2	I ¹ , I ⁴
Upland Sandpiper	1	2	2	1	2	2	I ¹ , I ⁴ , I ⁶
Long-billed Curlew	2	2	2	1	2	2	I ¹ , I ⁴ , I ⁶
Marbled Godwit	2	2	2	1	2	2	I ¹ , I ⁴ , I ⁶
Common Snipe	2	2	2	1	3	2	I ¹ , I ⁴
Wilson's Phalarope	2	2	2	1	3	2	I ¹ , I ⁴
Franklin's Gull	1	2	2	1	2	2	I ¹ , I ⁴ , I ⁶ , O ¹
Ring-billed Gull	1	2	2	1	3	2	I ¹ , I ⁴
California Gull	1	2	2	1	3	2	I ¹ , I ⁴
Herring Gull	1	2	2	1	3	2	I ¹ , I ⁴
Caspian Tern	1	2	2	1	2	2	I ¹ , I ⁴ , I ⁶ , O ¹
Common Tern	1	2	2	1	2	2	I ¹ , I ⁴ , I ⁶ , O ¹
Forster's Tern	1	2	2	1	2	2	I ¹ , I ⁴ , I ⁶ , O ¹
Black Tern	1	2	2	1	2	2	I ¹ , I ⁴ , I ⁶ , O ¹
Eastern Screech-owl	1	2	2	1	2	2	I ¹ , I ⁴
Great Horned Owl	2	2	2	1	2	2	I ¹ , I ⁴
Northern Pygmy-owl	1	2	2	2	2	2	I ¹ , I ⁴
Short-eared Owl	1	2	2	1	2	2	I ¹ , I ⁴
Vaux's Swift	1	2	2	1	2	2	I ¹ , I ⁴ , I ⁶
Calliope Hummingbird	2	2	2	1	3	2	I ¹ , I ⁴
Broad-tailed Hummingbird	1	2	2	1	3	2	I ¹ , I ⁴ , I ⁶ , I ⁷
Rufous Hummingbird	2	2	2	1	3	2	I ¹ , I ⁴

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Belted Kingfisher	2	2	2	1	3	2	I ¹ , I ⁴
Lewis's Woodpecker	1	2	2	1	2	2	I ¹ , I ⁴ , I ⁶
Red-headed Woodpecker	1	2	2	1	2	2	I ¹ , I ⁴ , I ⁶
Cassin's Kingbird	1	2	2	1	3	2	I ¹ , I ⁴ , I ⁶
Boreal Chickadee	2	2	2	1	2	2	I ¹ , I ⁴ , I ⁶
Chestnut-backed Chickadee	2	2	2	1	2	2	I ¹ , I ⁴ , I ⁶
Brown Creeper	2	2	2	1	2	2	I ¹ , I ⁴ , I ⁶
Rock Wren	2	2	2	1	3	2	I ¹ , I ⁴
Marsh Wren	1	2	2	1	2	2	I ¹ , I ⁴ , I ⁶
American Pipit	1	2	2	1	2	2	I ¹ , I ⁴ , I ⁶
Loggerhead Shrike	2	2	2	2	1	2	I ¹ , I ⁴ , I ⁶
Yellow-breasted Chat	2	2	2	1	2	2	I ¹ , I ⁴ , I ⁶
Snow Bunting	1	2	2	2	1	2	I ¹ , I ⁴
Orchard Oriole	1	2	2	1	2	2	I ¹ , I ⁴ , I ⁶
Baltimore Oriole	1	2	2	1	2	2	I ¹ , I ⁴ , I ⁶
Gray-crowned Rosy-finch	1	2	2	1	2	2	I ¹ , I ⁴ , I ⁶
White-winged Crossbill	1	2	2	1	2	2	I ¹ , I ⁴ , I ⁶
Mottled Sculpin	2	2	2	2	2	2	I ¹ , I ⁴
Slimy Sculpin	1	2	2	2	2	2	I ¹ , I ⁴
Pallid Sturgeon	2	2	2	3	1	2	I ¹ , I ⁴ , O ²
Northern Redbelly Dace	1	2	2	1	3	2	I ¹
Northern Redbelly X Finescale Dace	1	2	2	1	3	2	I ¹
Longnose Dace	2	2	2	2	2	2	I ¹
Redside Shiner	1	2	2	2	2	2	I ¹
Creek Chub	1	2	2	2	2	2	I ¹
Sturgeon Chub	1	2	2	2	2	2	I ^M
Sicklefin Chub	2	1	2	2	2	2	I ^M
Burbot	2	2	2	2	1	2	I ^M
Masked Shrew	2	2	2	1	3	2	I ¹ , I ⁴
Preble's Shrew	1	2	2	1	2	2	I ¹ , I ⁴
Vagrant Shrew	2	2	2	1	2	2	I ¹ , I ⁴
Dusky Or Montane Shrew	1	2	2	1	3	2	I ¹ , I ⁴
Dwarf Shrew	1	2	2	1	2	2	I ¹ , I ⁴
Water Shrew	2	2	2	1	2	2	I ¹ , I ⁴
Merriam's Shrew	1	2	2	1	2	2	I ¹ , I ⁴
Pygmy Shrew	1	2	2	1	2	2	I ¹ , I ⁴
Hayden's Shrew	1	2	2	1	2	2	I ¹ , I ⁴
Little Brown Myotis	2	2	2	1	2	2	I ¹ , I ⁴
Yuma Myotis	1	2	2	1	2	2	I ¹ , I ⁴
Long-eared Myotis	2	2	2	1	2	2	I ¹ , I ⁴
Fringed Myotis	1	2	2	1	2	2	I ¹ , I ⁴
Long-legged Myotis	1	2	2	1	2	2	I ¹ , I ⁴
California Myotis	1	2	2	1	2	2	I ¹ , I ⁴

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Western Small-footed Myotis	1	2	2	1	2	2	I ¹ ,I ⁴
Silver-haired Bat	2	2	2	1	2	2	I ¹ ,I ⁴
Big Brown Bat	2	2	2	1	2	2	I ¹ ,I ⁴
Hoary Bat	1	2	2	1	2	2	I ¹ ,I ⁴
Mountain Cottontail	2	2	2	1	2	2	I ^M
Desert Cottontail	1	2	2	1	3	2	I ^M
Snowshoe Hare	2	2	2	1	3	2	I ^M
White-tailed Jackrabbit	2	2	2	1	2	2	I ^M
Pygmy Rabbit	2	2	2	3	1	2	I ^M
Least Chipmunk	2	2	2	1	3	2	I ^M
Yellow-pine Chipmunk	2	2	2	1	3	2	I ^M
Red-tailed Chipmunk	2	2	2	1	3	2	I ^M
Yellow-bellied Marmot	2	2	2	1	3	2	I ^M
Richardson's Ground Squirrel	2	2	2	1	3	2	I ^M
Columbian Ground Squirrel	2	2	2	1	3	2	I ^M
Thirteen-lined Ground Squirrel	1	2	2	1	3	2	I ^M
Franklin's Ground Squirrel	1	2	2	1	3	2	I ^M
Golden-mantled Ground Squirrel	2	2	2	1	3	2	I ^M
Townsend's Ground Squirrel	1	2	2	1	3	2	I ^M
Eastern Fox Squirrel	1	2	2	1	3	2	I ^M
Northern Pocket Gopher	2	2	2	1	3	2	I ¹ ,I ⁴
Olive-backed Pocket Mouse	1	2	2	1	2	2	I ¹ ,I ⁴
Great Basin Pocket Mouse	1	2	2	1	2	2	I ¹ ,I ⁴
Ord's Kangaroo Rat	1	2	2	1	2	2	I ¹ ,I ⁴
American Beaver	2	2	2	1	3	2	I ^M
Western Harvest Mouse	1	2	2	1	3	2	I ¹ ,I ⁴
White-footed Mouse	1	2	2	1	2	2	I ¹ ,I ⁴
Northern Grasshopper Mouse	1	2	2	1	3	2	I ¹ ,I ⁴
Bushy-tailed Woodrat	2	2	2	1	3	2	I ¹ ,I ⁴
Southern Red-backed Vole	2	2	2	1	3	2	I ¹ ,I ⁴
Heather Vole	1	2	2	1	3	2	I ¹ ,I ⁴
Montane Vole	2	2	2	1	3	2	I ¹ ,I ⁴
Long-tailed Vole	2	2	2	1	3	2	I ¹ ,I ⁴
Prairie Vole	2	2	2	1	3	2	I ¹ ,I ⁴
Western Jumping Mouse	2	2	2	1	3	2	I ¹ ,I ⁴
Swift Fox	1	2	2	3	1	2	I ^M
Fisher	2	2	2	2	2	2	I ^M
Least Weasel	1	2	2	2	1	2	I ¹ ,I ⁴
American Badger	2	2	2	2	2	2	I ⁵
Short-horned Lizard	2	2	2	1	2	2	I ¹ ,I ⁴
Sagebrush Lizard	1	2	2	1	2	2	I ¹ ,I ⁴
Racer	2	2	2	1	3	2	I ¹ ,I ⁴
Gopher Snake	2	2	2	1	3	2	I ¹ ,I ⁴

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Plains Garter Snake	2	2	2	1	3	2	I ¹ , I ⁴
Western Rattlesnake	2	2	2	1	3	2	I ¹ , I ⁴
Fatmucket	1	2	2	1	3	2	I ¹ , I ⁴
Giant Floater	1	2	2	1	3	2	I ¹ , I ⁴
Long-toed Salamander	3	2	3	2	3	3	I ^M
Tiger Salamander	2	2	2	2	3	3	I ^M
Coeur D'alene Salamander	1	2	2	3	3	3	I ¹ , I ⁷
Roughskin Newt	1	4	3	1	3	3	I ¹ , I ⁷ , I ^M
Idaho Giant Salamander	1	1	1	1	1	3	I ¹ , I ⁷
Rocky Mountain Tailed Frog	3	2	3	2	1	3	I ^M
Boreal Toad	3	2	3	2	3	3	I ^M
Great Plains Toad	1	2	2	2	3	3	I ¹ , I ⁷
Canadian Toad	1	1	1	2	3	3	I ¹ , I ⁷
Woodhouse's Toad	2	2	2	2	3	3	I ^M
Boreal Chorus Frog	3	2	3	2	3	3	I ^M
Bullfrog	1	4	3	2	3	3	I ¹ , I ⁷
Northern Leopard Frog	3	2	3	2	2	3	I ^M
Wood Frog	1	1	1	2	3	3	I ¹ , I ⁷
Columbia Spotted Frog	3	2	3	2	3	3	I ¹ , I ⁷
Red-throated Loon	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷ , O ²
Pacific Loon	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷ , O ²
Common Loon	3	2	3	3	3	3	O ²
Yellow-billed Loon	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷ , O ²
American White Pelican	2	2	2	2	3	3	I ¹ , I ⁴ , O ²
Least Bittern	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Great Blue Heron	3	2	3	1	3	3	I ^M , O ²
Great Egret	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Little Blue Heron	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Green Heron	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Yellow-crowned Night-heron	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Wood Stork	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Tundra Swan	2	2	2	2	3	3	I ¹ , I ⁴ , O ²
Trumpeter Swan	1	2	2	3	3	3	I ¹ , I ⁴ , O ²
Mute Swan	1	2	2	2	3	3	I ¹ , I ⁴ , I ⁷ , O ²
Greater White-fronted Goose	1	1	1	2	3	3	I ¹ , I ⁴ , I ⁷
Snow Goose	1	2	2	2	3	3	I ¹ , O ¹ , O ²
Ross' Goose	1	2	2	2	3	3	I ¹ , O ¹ , O ²
Brant	1	4	3	2	3	3	I ¹ , I ⁴ , I ⁷
Canada Goose	3	2	3	2	3	3	O ¹ , O ²
Wood Duck	1	2	2	2	3	3	I ¹ , O ¹ , O ²
Green-winged Teal	2	2	2	2	3	3	I ¹ , O ¹ , O ²
American Black Duck	1	2	2	2	3	3	I ¹ , O ¹ , O ²
Mallard	3	2	3	2	3	3	O ¹ , O ²

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Northern Pintail	2	2	2	2	3	3	I ¹ , O ¹ , O ²
Garganey	1	4	3	2	3	3	I ¹ , I ⁴ , I ⁷
Blue-winged Teal	1	2	2	2	3	3	I ¹ , O ¹ , O ²
Cinnamon Teal	1	2	2	2	3	3	I ¹ , O ¹ , O ²
Northern Shoveler	2	2	2	2	3	3	I ¹ , O ¹ , O ²
Gadwall	1	2	2	2	3	3	I ¹ , O ¹ , O ²
Eurasian Wigeon	1	4	3	2	3	3	I ¹ , I ⁴ , I ⁷
American Wigeon	2	2	2	2	3	3	I ¹ , O ¹ , O ²
Canvasback	1	2	2	2	3	3	I ¹ , O ¹ , O ²
Redhead	1	2	2	2	3	3	I ¹ , O ¹ , O ²
Ring-necked Duck	1	2	2	2	3	3	I ¹ , O ¹ , O ²
Greater Scaup	1	2	2	2	3	3	I ¹ , O ¹ , O ²
Lesser Scaup	1	2	2	2	3	3	I ¹ , O ¹ , O ²
Harlequin Duck	3	2	3	1	1	3	I ^M , O ¹ , O ²
Long Tailed Duck	1	2	2	2	3	3	I ¹ , O ¹ , O ²
Black Scoter	1	4	3	2	3	3	I ¹ , I ⁴ , I ⁷
Surf Scoter	1	4	3	2	3	3	I ¹ , I ⁴ , I ⁷
White-winged Scoter	1	2	2	2	3	3	I ¹ , O ¹ , O ²
Common Goldeneye	2	2	2	2	3	3	I ¹ , O ¹ , O ²
Barrow's Goldeneye	2	2	2	2	3	3	I ¹ , O ¹ , O ²
Bufflehead	2	2	2	2	3	3	I ¹ , O ¹ , O ²
Hooded Merganser	1	2	2	2	3	3	I ¹ , O ¹ , O ²
Common Merganser	3	2	3	2	3	3	O ¹ , O ²
Red-breasted Merganser	1	2	2	2	3	3	I ¹ , O ¹ , O ²
Ruddy Duck	1	2	2	2	3	3	I ¹ , O ¹ , O ²
Turkey Vulture	1	2	2	2	3	3	I ¹ , I ⁴
Osprey	3	2	3	2	3	3	I ^M
Bald Eagle	3	2	3	3	3	3	I ^M , O ²
Red-shouldered Hawk	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Broad-winged Hawk	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Red-tailed Hawk	3	2	3	2	2	3	I ^M
Ferruginous Hawk	3	2	3	2	3	3	I ^M
Golden Eagle	3	2	3	1	2	3	I ^M , O ²
Peregrine Falcon	1	2	2	3	3	3	I ¹
Gray Partridge	1	4	3	2	3	3	I ¹ , O ²
Chukar	1	4	3	2	3	3	I ¹ , O ²
Ring-necked Pheasant	1	4	3	2	3	3	I ¹ , O ²
Spruce Grouse	2	2	2	2	3	3	I ¹ , O ²
Blue Grouse	2	2	2	2	3	3	I ¹ , O ²
Willow Ptarmigan	1	1	1	1	2	3	I ¹ , I ⁴ , I ⁷
White-tailed Ptarmigan	1	1	1	1	2	3	I ¹ , I ⁴ , I ⁷
Ruffed Grouse	3	2	3	2	3	3	I ^M
Sage-grouse	1	2	2	4	2	3	I ¹ , O ²

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Sharp-tailed Grouse	1	2	2	3	3	3	I ¹ , O ²
Wild Turkey	1	4	3	2	3	3	I ¹ , O ²
Common Moorhen	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Greater Sandhill Crane	1	2	2	3	3	3	I ¹ , O ²
Lesser Sandhill Crane	1	2	2	3	3	3	I ¹ , O ²
Whooping Crane	1	1	1	3	3	3	I ¹ , O ²
Black-bellied Plover	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
American Golden-plover	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Snowy Plover	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Semipalmated Plover	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Piping Plover	2	2	2	3	3	3	I ¹ , I ⁴ , O ¹
Killdeer	3	2	3	1	3	3	I ^M
Mountain Plover	3	2	3	3	3	3	I ^M
Whimbrel	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Hudsonian Godwit	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Ruddy Turnstone	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Black Turnstone	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Red Knot	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Sanderling	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Curlew Sandpiper	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Stilt Sandpiper	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Buff-breasted Sandpiper	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Short-billed Dowitcher	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
American Woodcock	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Red-necked Phalarope	2	4	3	1	3	3	I ¹ , I ⁴ , I ^M
Red Phalarope	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Pomarine Jaeger	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Parasitic Jaeger	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Long-tailed Jaeger	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Laughing Gull	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Bonaparte's Gull	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Mew Gull	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Thayer's Gull	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Great Black-backed Gull	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Black-legged Kittiwake	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Sabine's Gull	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Ivory Gull	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Least Tern	2	2	2	3	3	3	I ¹ , I ⁴ , O ¹
Marbled Murrelet	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Ancient Murrelet	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Rock Dove	1	4	3	1	3	3	I ¹ , I ⁷ , I ^M
Band-tailed Pigeon	1	4	3	1	3	3	I ¹ , I ⁷ , I ^M
Eurasian Collared-dove	1	4	3	1	3	3	I ¹ , I ⁷ , I ^M

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White-winged Dove	1	4	3	1	3	3	I ¹ , I ⁷ , I ^M
Mourning Dove	3	2	3	3	3	3	I ^M
Flammulated Owl	1	2	2	3	2	3	I ¹ , I ⁴ , O ¹
Western Screech-owl	1	2	2	2	3	3	I ¹ , I ⁴
Burrowing Owl	3	2	3	3	3	3	I ^M
Barred Owl	1	2	2	2	3	3	I ¹ , I ⁴
Great Gray Owl	2	2	2	2	3	3	I ¹ , I ⁴
Long-eared Owl	1	2	2	2	3	3	I ¹ , I ⁴
Boreal Owl	2	2	2	2	3	3	I ¹ , I ⁴
Northern Saw-whet Owl	1	2	2	2	3	3	I ¹ , I ⁴
Whip-poor-will	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Ruby-throated Hummingbird	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Red-bellied Woodpecker	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Yellow-bellied Sapsucker	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Williamson's Sapsucker	2	2	2	2	3	3	I ¹ , I ⁴
Red-naped Sapsucker	3	2	3	2	3	3	I ^M
Downy Woodpecker	2	2	2	2	3	3	I ¹ , I ⁴
Hairy Woodpecker	3	2	3	2	3	3	I ^M
White-headed Woodpecker	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Three-toed Woodpecker	2	2	2	2	3	3	I ¹ , I ⁴ , O ¹
Black-backed Woodpecker	2	2	2	2	3	3	I ¹ , I ⁴ , O ¹
Northern Flicker	3	2	3	2	3	3	I ^M
Pileated Woodpecker	3	2	3	2	3	3	I ^M
Olive-sided Flycatcher	3	2	3	2	3	3	I ^M
Western Wood-pewee	2	2	2	2	3	3	I ¹ , I ⁴
Eastern Wood-pewee	1	4	3	2	3	3	I ¹ , I ⁴
Yellow-bellied Flycatcher	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Willow Flycatcher	2	2	2	2	3	3	I ¹ , I ⁴
Least Flycatcher	2	2	2	2	3	3	I ¹ , I ⁴
Hammond's Flycatcher	3	2	3	2	3	3	I ^M
Dusky Flycatcher	3	2	3	2	3	3	I ^M
Cordilleran Flycatcher	2	2	2	2	3	3	I ¹ , I ⁴
Eastern Phoebe	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Say's Phoebe	1	2	2	2	3	3	I ¹ , I ⁴
Ash-throated Flycatcher	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Great Crested Flycatcher	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Western Kingbird	1	2	2	2	3	3	I ¹ , I ⁴
Eastern Kingbird	2	2	2	2	3	3	I ¹ , I ⁴
Scissor-tailed Flycatcher	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
Horned Lark	3	2	3	2	3	3	I ^M
Tree Swallow	2	2	2	2	3	3	I ^M
Violet-green Swallow	2	2	2	2	3	3	I ¹ , I ⁴
Northern Rough-winged Swallow	1	2	2	2	3	3	I ¹ , I ⁴

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Bank Swallow	1	2	2	2	3	3	I ¹ , I ⁴
Cliff Swallow	2	2	2	2	3	3	I ¹ , I ⁴
Barn Swallow	2	2	2	2	3	3	I ¹ , I ⁴
Gray Jay	3	2	3	2	3	3	I ^M
Steller's Jay	2	2	2	2	3	3	I ^M
Blue Jay	1	2	2	2	3	3	I ¹ , I ⁴
Pinyon Jay	1	2	2	2	3	3	I ¹ , I ⁴
Clark's Nutcracker	3	2	3	2	3	3	I ^M
Black-billed Magpie	2	2	2	2	3	3	I ¹ , I ⁴
American Crow	2	2	2	2	3	3	I ^M
Common Raven	3	2	3	2	3	3	I ^M
Black-capped Chickadee	3	2	3	2	3	3	I ^M
Mountain Chickadee	3	2	3	2	3	3	I ^M
Red-breasted Nuthatch	3	2	3	2	3	3	I ^M
White-breasted Nuthatch	2	2	2	2	3	3	I ¹ , I ⁴
Pygmy Nuthatch	1	2	2	2	3	3	I ¹ , I ⁴
Bewick's Wren	1	1	1	1	3	3	I ¹ , I ⁴ , I ⁷
House Wren	3	2	3	2	3	3	I ^M
Winter Wren	3	2	3	1	3	3	I ^M
Golden-crowned Kinglet	3	2	3	2	3	3	I ^M
Ruby-crowned Kinglet	3	2	3	2	3	3	I ^M
Mountain Bluebird	3	2	3	2	3	3	I ^M
Townsend's Solitaire	3	2	3	2	3	3	I ^M
Veery	1	2	2	2	3	3	I ¹ , I ⁴
Gray-cheeked Thrush	1	4	3	2	3	3	I ¹
Swainson's Thrush	3	2	3	2	3	3	I ^M
Hermit Thrush	3	2	3	2	3	3	I ^M
Wood Thrush	1	4	3	2	3	3	I ¹
American Robin	3	2	3	2	3	3	I ^M
Varied Thrush	3	2	3	2	3	3	I ^M
Gray Catbird	2	2	2	2	3	3	I ¹ , I ⁴
Northern Mockingbird	1	2	2	2	3	3	I ¹ , I ⁴
Sage Thrasher	1	2	2	2	3	3	I ¹ , I ⁴
Brown Thrasher	1	2	2	2	3	3	I ¹ , I ⁴
Sprague's Pipit	2	2	2	2	3	3	I ^M
Bohemian Waxwing	1	2	2	2	3	3	I ¹ , I ⁴
Cedar Waxwing	2	2	2	2	3	3	I ¹ , I ⁴
Northern Shrike	1	2	2	2	3	3	I ¹ , I ⁴
European Starling	2	4	3	2	3	3	I ^M
Warbling Vireo	3	2	3	2	3	3	I ^M
Philadelphia Vireo	1	4	3	2	3	3	I ¹
Red-eyed Vireo	2	2	2	2	3	3	I ¹ , I ⁴
Cassin's Vireo	1	2	2	2	3	3	I ¹ , I ⁴

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Golden-winged Warbler	1	4	3	2	3	3	I ¹
Tennessee Warbler	1	2	2	2	3	3	I ¹ , I ⁴
Orange-crowned Warbler	3	2	3	2	3	3	I ^M
Nashville Warbler	2	2	2	2	3	3	I ¹ , I ⁴
Northern Parula	1	4	3	2	3	3	I ¹
Yellow Warbler	3	2	3	2	3	3	I ^M
Chestnut-sided Warbler	1	4	3	2	3	3	I ¹
Magnolia Warbler	1	4	3	2	3	3	I ¹
Cape May Warbler	1	4	3	2	3	3	I ¹
Black-throated Blue Warbler	1	1	1	2	3	3	I ¹ , I ⁴
Yellow-rumped Warbler	3	2	3	2	3	3	I ^M
Black-throated Gray Warbler	1	1	1	2	3	3	I ¹ , I ⁴
Townsend's Warbler	3	2	3	2	3	3	I ^M
Black-throated Green Warbler	1	4	3	2	3	3	I ¹
Blackburnian Warbler	1	4	3	2	3	3	I ¹
Yellow-throated Warbler	1	4	3	2	3	3	I ¹
Pine Warbler	1	4	3	2	3	3	I ¹
Prairie Warbler	1	4	3	2	3	3	I ¹
Palm Warbler	1	4	3	2	3	3	I ¹
Bay-breasted Warbler	1	4	3	2	3	3	I ¹
Blackpoll Warbler	1	4	3	2	3	3	I ¹
American Redstart	2	2	2	2	3	3	I ¹ , I ⁴
Prothonotary Warbler	1	4	3	2	3	3	I ¹
Ovenbird	1	2	2	2	3	3	I ¹ , I ⁴
Northern Waterthrush	2	2	2	2	3	3	I ¹ , I ⁴
Kentucky Warbler	1	4	3	2	3	3	I ¹
Connecticut Warbler	1	4	3	2	3	3	I ¹
Mourning Warbler	1	4	3	2	3	3	I ¹
Macgillivray's Warbler	3	2	3	2	3	3	I ^M
Common Yellowthroat	2	2	2	2	3	3	I ^M
Hooded Warbler	1	4	3	2	3	3	I ¹
Wilson's Warbler	2	2	2	2	3	3	I ^M
Canada Warbler	1	4	3	2	3	3	I ¹
Painted Redstart	1	4	3	2	3	3	I ¹
Summer Tanager	1	4	3	2	3	3	I ¹
Scarlet Tanager	1	4	3	2	3	3	I ¹
Western Tanager	3	2	3	2	3	3	I ^M
Northern Cardinal	1	4	3	2	3	3	I ¹
Rose-breasted Grosbeak	1	4	3	2	3	3	I ¹
Black-headed Grosbeak	2	2	2	2	3	3	I ^M
Lazuli Bunting	2	2	2	2	3	3	I ¹ , I ⁴
Painted Bunting	1	4	3	2	3	3	I ¹
Dickcissel	1	1	1	2	3	3	I ¹ , I ⁴

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Spotted Towhee	2	2	2	2	3	3	I ¹ , I ⁴
American Tree Sparrow	1	2	2	2	3	3	I ¹ , I ⁴
Chipping Sparrow	3	2	3	2	3	3	I ^M
Clay-colored Sparrow	1	2	2	2	3	3	I ¹ , I ⁴
Brewer's Sparrow	2	2	2	2	3	3	I ¹ , I ⁴
Vesper Sparrow	3	2	3	2	3	3	I ^M
Lark Sparrow	2	2	2	2	3	3	I ¹ , I ⁴
Black-throated Sparrow	1	4	3	2	3	3	I ¹
Sage Sparrow	1	2	2	2	3	3	I ¹ , I ⁴
Lark Bunting	2	2	2	2	3	3	I ¹ , I ⁴
Savannah Sparrow	2	2	2	2	3	3	I ^M
Baird's Sparrow	3	2	3	2	3	3	I ^M
Grasshopper Sparrow	2	2	2	2	3	3	I ¹ , I ⁴
Fox Sparrow	2	2	2	2	3	3	I ¹ , I ⁴
Song Sparrow	3	2	3	2	3	3	I ^M
Lincoln's Sparrow	3	2	3	2	3	3	I ^M
Swamp Sparrow	1	1	1	2	3	3	I ¹ , I ⁴
White-throated Sparrow	1	2	2	2	3	3	I ¹ , I ⁴
Golden-crowned Sparrow	1	4	3	2	3	3	I ¹
White-crowned Sparrow	3	2	3	2	3	3	I ^M
Harris's Sparrow	1	2	2	2	3	3	I ¹ , I ⁴
Dark-eyed Junco	3	2	3	2	3	3	I ^M
Mccown's Longspur	1	2	2	2	3	3	I ¹ , I ⁴
Lapland Longspur	1	2	2	2	3	3	I ¹ , I ⁴
Smith's Longspur	1	4	3	2	3	3	I ¹
Chestnut-collared Longspur	3	2	3	2	3	3	I ^M
Bobolink	1	2	2	2	3	3	I ¹ , I ⁴
Red-winged Blackbird	2	2	2	2	3	3	I ^M
Western Meadowlark	3	2	3	2	3	3	I ^M
Yellow-headed Blackbird	1	2	2	2	3	3	I ¹ , I ⁴
Rusty Blackbird	1	2	2	2	3	3	I ¹ , I ⁴
Brewer's Blackbird	2	2	2	2	3	3	I ¹ , I ⁴
Great-tailed Grackle	1	4	3	2	3	3	I ¹
Common Grackle	2	2	2	2	3	3	I ¹ , I ⁴
Brown-headed Cowbird	3	2	3	2	3	3	I ^M
Hooded Oriole	1	4	3	2	3	3	I ¹
Bullock's Oriole	1	2	2	2	3	3	I ¹ , I ⁴
Brambling	1	1	1	2	3	3	I ¹ , I ⁴
Pine Grosbeak	2	2	2	2	3	3	I ¹ , I ⁴
Purple Finch	1	1	1	2	3	3	I ¹ , I ⁴
Cassin's Finch	3	2	3	2	3	3	I ^M
House Finch	1	2	2	2	3	3	I ¹ , I ⁴
Red Crossbill	3	2	3	2	3	3	I ^M

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Common Redpoll	1	2	2	2	3	3	I ¹ , I ⁴
Hoary Redpoll	1	1	1	2	3	3	I ¹ , I ⁴
Pine Siskin	3	2	3	2	3	3	I ^M
Lesser Goldfinch	1	4	3	2	3	3	I ¹
American Goldfinch	2	2	2	2	3	3	I ¹ , I ⁴
Evening Grosbeak	3	2	3	2	3	3	I ^M
House Sparrow	1	4	3	2	3	3	I ¹
White Sturgeon	1	1	1	2	3	3	I ¹ , I ⁴
Shovelnose Sturgeon	2	2	2	2	3	3	I ^M
Paddlefish	2	2	2	3	3	3	I ^M , O ²
Goldeye	3	2	3	2	3	3	I ^M
Cisco	1	4	3	2	3	3	I ^M
Lake Whitefish	1	2	2	2	3	3	I ^M
Kokanee Salmon	2	4	3	2	3	3	I ^M
Chinook Salmon	1	4	3	2	3	3	I ^M
Yellowstone Cutthroat Trout	3	2	3	3	3	3	I ^M
Westslope Cutthroat Trout	3	2	3	3	3	3	I ^M , O ²
Rainbow Trout	3	4	4	2	3	3	I ^M
Columbia Basin Redband Trout	1	2	2	3	3	3	I ^M
Golden Trout	1	4	3	2	3	3	I ^M
Pygmy Whitefish	1	2	2	2	3	3	I ¹ , I ⁴
Mountain Whitefish	3	2	3	2	3	3	I ^M
Brown Trout	3	4	4	2	3	3	I ^M
Bull Trout	2	2	2	3	3	3	I ^M , O ²
Brook Trout	3	4	4	2	3	3	I ^M
Arctic Grayling	2	2	2	3	3	3	I ^M
Rainbow Smelt	1	4	3	2	3	3	I ^M
Northern Pike	3	4	4	2	3	3	I ^M
Goldfish	1	4	3	2	3	3	I ¹ , I ⁴
Lake Chub	1	2	2	2	3	3	I ¹ , I ⁴
Common Carp	3	4	4	2	3	3	I ^M
Utah Chub	1	4	3	2	3	3	I ¹ , I ⁴
Peamouth	1	2	2	2	3	3	I ¹ , I ⁴
Golden Shiner	1	4	3	2	3	3	I ¹ , I ⁴
Emerald Shiner	2	2	2	2	3	3	I ¹ , I ⁴
Spottail Shiner	1	4	3	2	3	3	I ¹ , I ⁴
Sand Shiner	1	2	2	2	3	3	I ¹ , I ⁴
Fathead Minnow	2	2	2	2	3	3	I ¹ , I ⁴
Northern Pikeminnow	1	2	2	2	3	3	I ¹ , I ⁴
Flathead Chub	3	2	3	2	3	3	I ^M
River Carpsucker	3	2	3	2	3	3	I ^M
Longnose Sucker	3	2	3	2	3	3	I ^M
White Sucker	3	2	3	2	3	3	I ^M

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Largescale Sucker	1	2	2	2	3	3	I ¹ , I ⁴
Mountain Sucker	1	2	2	2	3	3	I ^M
Blue Sucker	2	2	2	3	3	3	I ^M
Smallmouth Buffalo	2	2	2	2	3	3	I ^M
Bigmouth Buffalo	2	2	2	2	3	3	I ^M
Shorthead Redhorse	3	2	3	2	3	3	I ^M
Channel Catfish	3	2	3	2	3	3	I ^M
Stonecat	2	2	2	2	3	3	I ^M
Black Bullhead	1	4	3	2	3	3	I ¹ , I ⁴
Yellow Bullhead	1	4	3	2	3	3	I ¹ , I ⁴
Plains Killifish	1	4	3	2	3	3	I ¹ , I ⁴
Western Mosquitofish	1	4	3	2	3	3	I ¹ , I ⁴
Sailfin Molly	1	4	3	2	3	3	I ¹ , I ⁷
Shortfin Molly	1	4	3	2	3	3	I ¹ , I ⁷
Green Swordtail	1	4	3	2	3	3	I ¹ , I ⁷
Variable Platyfish	1	4	3	2	3	3	I ¹ , I ⁷
Brook Stickleback	1	2	2	2	3	3	I ¹ , I ⁴
White Bass	1	4	3	2	3	3	I ¹ , I ⁴
Rock Bass	1	4	3	2	3	3	I ¹ , I ⁴
Green Sunfish	1	4	3	2	3	3	I ¹ , I ⁴
Pumpkinseed	1	4	3	2	3	3	I ¹ , I ⁴
Bluegill	1	4	3	2	3	3	I ¹ , I ⁴
Smallmouth Bass	2	4	3	2	3	3	I ^M
Largemouth Bass	1	4	3	2	3	3	I ^M
White Crappie	1	4	3	2	3	3	I ^M
Black Crappie	2	4	3	2	3	3	I ^M
Yellow Perch	3	4	4	2	3	3	I ^M
Sauger	3	2	3	2	2	3	I ^M , O ²
Walleye	3	4	4	2	3	3	I ^M
Freshwater Drum	2	2	2	2	3	3	I ^M
Northern Short-tailed Shrew	1	1	1	1	3	3	I ¹ , I ⁷
Black-tailed Prairie Dog	2	2	2	3	3	3	I ^M , O ²
White-tailed Prairie Dog	1	1	1	3	3	3	I ^M , O ²
Eastern Gray Squirrel	1	4	3	1	3	3	I ¹ , I ⁴ , I ^M
Red Squirrel	3	2	3	1	3	3	I ^M
Plains Pocket Mouse	1	1	1	1	3	3	I ¹ , I ⁴
Deer Mouse	3	2	3	1	3	3	I ^M
Meadow Vole	3	2	3	1	3	3	I ^M
Muskrat	2	2	2	2	3	3	I ^M
Norway Rat	1	4	3	1	3	3	I ¹ , I ⁴ , I ^M
House Mouse	1	4	3	1	3	3	I ¹ , I ⁴ , I ^M
Coyote	3	2	3	2	3	3	I ^M
Gray Wolf	2	2	2	3	3	3	I ^M , O ²

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Red Fox	2	2	2	2	3	3	I ^M
Black Bear	3	2	3	4	3	3	I ^M
Grizzly Bear	2	2	2	3	3	3	I ^M , O ²
Common Raccoon	2	4	3	2	3	3	I ^M
American Marten	3	2	3	2	3	3	I ^M
Ermine	1	2	2	2	3	3	I ^M
Long-tailed Weasel	2	2	2	2	3	3	I ^M
Black-footed Ferret	1	1	1	3	3	3	I ^M , O ²
Mink	2	2	2	2	3	3	I ^M
Wolverine	3	2	3	3	3	3	I ^M
Striped Skunk	2	2	2	2	3	3	I ^M
Northern River Otter	2	2	2	2	3	3	I ^M
Lynx	3	2	3	3	3	3	I ^M , O ²
Bobcat	2	2	2	2	3	3	I ^M , O ²
Mountain Lion	3	2	3	4	3	3	I ^M
Wapiti Or Elk	3	2	3	4	3	3	I ^M
Mule Deer	3	2	3	4	3	3	I ^M
White-tailed Deer	3	2	3	4	3	3	I ^M
Moose	3	2	3	4	3	3	I ^M
Caribou	1	1	1	1	3	3	I ¹ , I ⁷
Pronghorn	3	2	3	4	3	3	I ^M
American Bison	1	1	1	3	3	3	I ^M , O ²
Mountain Goat	3	2	3	4	3	3	I ^M
Bighorn Sheep	3	2	3	4	3	3	I ^M
Feral Horse	1	4	3	3	3	3	I ^M
Painted Turtle	3	2	3	1	3	3	I ^M
Western Terrestrial Garter Snake	3	2	3	1	3	3	I ^M
Common Garter Snake	3	2	3	1	3	3	I ^M
White Heelsplitter	1	2	2	1	3	3	I ¹ , I ⁴

14432 **Table 10. Bitterroot/Frenchtown Valleys Focus Area-Species Associations**

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TOTAL: 342	TIER II: 96			
Group Breakdown Amphibians: 8 Birds: 252 Mammals: 73 Reptiles: 9	Long-toed Salamander	Marbled Godwit	Veery	Idaho Pocket Gopher
	Tailed Frog	Franklin's Gull	Loggerhead Shrike	Water Vole
	Pacific Treefrog	Caspian Tern	American Redstart	American Marten
	Columbia Spotted Frog	Common Tern	Yellow-breasted Chat	Fisher
	Horned Grebe	Forster's Tern	Green-tailed Towhee	Wolverine
	Red-necked Grebe	Northern Pygmy-owl	Clay-colored Sparrow	American Badger
	Western Grebe	Barred Owl	Brewer's Sparrow	Western Spotted Skunk
	American Bittern	Great Gray Owl	Baird's Sparrow	Northern River Otter
	Black-crowned Night-heron	Boreal Owl	Grasshopper Sparrow	Northern Alligator Lizard
	White-faced Ibis	Northern Saw-whet Owl	Le Conte's Sparrow	Western Skink
TIER I: 16		Black Swift	Bullock's Oriole	Rubber Boa
Coeur D'alene Salamander	Canvasback	Vaux's Swift	Gray-crowned Rosy-finch	Common Garter Snake
Boreal Toad	Redhead	Black-chinned Hummingbird	White-winged Crossbill	Western Rattlesnake
Northern Leopard Frog	Hooded Merganser	Anna's Hummingbird	Preble's Shrew	
Common Loon	Turkey Vulture	Broad-tailed Hummingbird	Vagrant Shrew	TIER III: 210
Trumpeter Swan	Northern Harrier	Lewis' Woodpecker	Pygmy Shrew	Pied-billed Grebe
Harlequin Duck	Sharp-shinned Hawk	Williamson's Sapsucker	Yuma Myotis	Eared Grebe
Bald Eagle	Cooper's Hawk	Three-toed Woodpecker	Long-eared Myotis	Clark's Grebe
Long-billed Curlew	Northern Goshawk	Pileated Woodpecker	Fringed Myotis	American White Pelican
Black Tern	Swainson's Hawk	Hammond's Flycatcher	Long-legged Myotis	Double-crested Cormorant
Flammulated Owl	Ferruginous Hawk	Boreal Chickadee	California Myotis	Great Blue Heron
Black-backed Woodpecker	Golden Eagle	Chestnut-backed Chickadee	Western Small-footed Myotis	Snowy Egret
Olive-sided Flycatcher	Merlin	White-breasted Nuthatch	Silver-haired Bat	Cattle Egret
Townsend's Big-eared Bat	Peregrine Falcon	Pygmy Nuthatch	Big Brown Bat	Tundra Swan
Northern Bog Lemming	Prairie Falcon	Brown Creeper	Hoary Bat	Greater White-fronted Goose
Gray Wolf	Blue Grouse	Canyon Wren	Mountain Cottontail	Snow Goose
Grizzly Bear	Greater Sandhill Crane	Winter Wren	White-tailed Jackrabbit	Ross' Goose
	Upland Sandpiper	Western Bluebird	Northern Flying Squirrel	Canada Goose

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Wood Duck	American Avocet	Western Wood-pewee	Mountain Bluebird	Chipping Sparrow
Green-winged Teal	Greater Yellowlegs	Willow Flycatcher	Townsend's Solitaire	Vesper Sparrow
Mallard	Lesser Yellowlegs	Least Flycatcher	Swainson's Thrush	Lark Sparrow
Northern Pintail	Willet	Dusky Flycatcher	Hermit Thrush	Savannah Sparrow
Blue-winged Teal	Spotted Sandpiper	Cordilleran Flycatcher	American Robin	Fox Sparrow
Cinnamon Teal	Semipalmated Sandpiper	Say's Phoebe	Varied Thrush	Song Sparrow
Northern Shoveler	Western Sandpiper	Western Kingbird	Gray Catbird	Lincoln's Sparrow
Gadwall	Least Sandpiper	Eastern Kingbird	Brown Thrasher	White-throated Sparrow
American Wigeon	Baird's Sandpiper	Horned Lark	American Pipit	White-crowned Sparrow
Ring-necked Duck	Pectoral Sandpiper	Tree Swallow	Bohemian Waxwing	Dark-eyed Junco
Greater Scaup	Dunlin	Violet-green Swallow	Cedar Waxwing	Lapland Longspur
Lesser Scaup	Long-billed Dowitcher	Northern Rough-winged Swallow	Northern Shrike	Snow Bunting
Long Tailed Duck	Common Snipe	Bank Swallow	Warbling Vireo	Bobolink
Common Goldeneye	Wilson's Phalarope	Cliff Swallow	Red-eyed Vireo	Red-winged Blackbird
Barrow's Goldeneye	Ring-billed Gull	Barn Swallow	Cassin's Vireo	Western Meadowlark
Bufflehead	California Gull	Gray Jay	Tennessee Warbler	Yellow-headed Blackbird
Common Merganser	Herring Gull	Steller's Jay	Orange-crowned Warbler	Rusty Blackbird
Red-breasted Merganser	Mourning Dove	Blue Jay	Nashville Warbler	Brewer's Blackbird
Ruddy Duck	Western Screech-owl	Clark's Nutcracker	Yellow Warbler	Common Grackle
Osprey	Great Horned Owl	Black-billed Magpie	Black-throated Blue Warbler	Brown-headed Cowbird
Red-tailed Hawk	Snowy Owl	American Crow	Yellow-rumped Warbler	Pine Grosbeak
Rough-legged Hawk	Short-eared Owl	Common Raven	Townsend's Warbler	Cassin's Finch
American Kestrel	Common Nighthawk	Black-capped Chickadee	Northern Waterthrush	House Finch
Gyr Falcon	White-throated Swift	Mountain Chickadee	Macgillivray's Warbler	Red Crossbill
Spruce Grouse	Calliope Hummingbird	Red-breasted Nuthatch	Common Yellowthroat	Common Redpoll
Ruffed Grouse	Rufous Hummingbird	Rock Wren	Wilson's Warbler	Pine Siskin
Virginia Rail	Belted Kingfisher	House Wren	Western Tanager	American Goldfinch
Sora	Red-naped Sapsucker	Marsh Wren	Black-headed Grosbeak	Evening Grosbeak
American Coot	Downy Woodpecker	American Dipper	Lazuli Bunting	Masked Shrew
Killdeer	Hairy Woodpecker	Golden-crowned Kinglet	Spotted Towhee	Dusky Or Montane Shrew
Black-necked Stilt	Northern Flicker	Ruby-crowned Kinglet	American Tree Sparrow	Water Shrew

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Little Brown Myotis	Mountain Lion
American Pika	Wapiti Or Elk
Snowshoe Hare	Mule Deer
Least Chipmunk	White-tailed Deer
Yellow-pine Chipmunk	Moose
Red-tailed Chipmunk	Mountain Goat
Yellow-bellied Marmot	Bighorn Sheep
Columbian Ground Squirrel	Painted Turtle
Golden-mantled Ground Squirrel	Racer
Eastern Fox Squirrel	Gopher Snake
Red Squirrel	Western Terrestrial Garter Snake
Northern Pocket Gopher	
American Beaver	TIER IV: 18
Deer Mouse	Bullfrog
Bushy-tailed Woodrat	Gray Partridge
Southern Red-backed Vole	Chukar
Heather Vole	Ring-necked Pheasant
Meadow Vole	Wild Turkey
Montane Vole	Bonaparte's Gull
Long-tailed Vole	Rock Dove
Muskrat	Yellow-bellied Sapsucker
Western Jumping Mouse	European Starling
Common Porcupine	Chestnut-sided Warbler
Coyote	Palm Warbler
Red Fox	Blackpoll Warbler
Black Bear	Rose-breasted Grosbeak
Ermine	House Sparrow
Long-tailed Weasel	Eastern Gray Squirrel
Mink	Norway Rat
Striped Skunk	House Mouse
Bobcat	Common Raccoon

14435 **Table 11. Central Montana Broad Valleys Focus Area-Species Associations**

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TOTAL: 317	Tiger Salamander	Alder Flycatcher	Silver-haired Bat	Cattle Egret
Group Breakdown Amphibians: 9 Birds: 228 Mammals: 73 Reptiles: 7	Tailed Frog	Hammond's Flycatcher	Big Brown Bat	Tundra Swan
	Woodhouse's Toad	Pinyon Jay	Hoary Bat	Greater White-fronted Goose
	Plains Spadefoot	White-breasted Nuthatch	Mountain Cottontail	Snow Goose
	Columbia Spotted Frog	Canyon Wren	White-tailed Jackrabbit	Ross' Goose
	Horned Grebe	Western Bluebird	Northern Flying Squirrel	Canada Goose
	Western Grebe	Veery	Olive-backed Pocket Mouse	Wood Duck
	American Bittern	Loggerhead Shrike	White-footed Mouse	Green-winged Teal
	Canvasback	American Redstart	Sagebrush Vole	Mallard
TIER I: 14	Redhead	Clay-colored Sparrow	American Marten	Northern Pintail
Boreal Toad	Turkey Vulture	Brewer's Sparrow	Least Weasel	Blue-winged Teal
Northern Leopard Frog	Northern Harrier	Field Sparrow	Wolverine	Cinnamon Teal
Common Loon	Sharp-shinned Hawk	Lark Bunting	American Badger	Northern Shoveler
Bald Eagle	Cooper's Hawk	Grasshopper Sparrow	Northern River Otter	Gadwall
Sage-grouse	Northern Goshawk	Baltimore Oriole	Short-horned Lizard	Ring-necked Duck
Mountain Plover	Swainson's Hawk	Bullock's Oriole	Rubber Boa	Greater Scaup
Long-billed Curlew	Ferruginous Hawk	Preble's Shrew	Western Rattlesnake	Lesser Scaup
Black Tern	Golden Eagle	Vagrant Shrew	TIER III: 199	White-winged Scoter
Burrowing Owl	Merlin	Merriam's Shrew		Common Goldeneye
Townsend's Big-eared Bat	Prairie Falcon	Pygmy Shrew	Boreal Chorus Frog	Barrow's Goldeneye
Pallid Bat	Blue Grouse	Hayden's Shrew	Pied-billed Grebe	Bufflehead
Black-tailed Prairie Dog	Greater Sandhill Crane	Yuma Myotis	Eared Grebe	Common Merganser
Grizzly Bear	Upland Sandpiper	Long-eared Myotis	Clark's Grebe	Red-breasted Merganser
Lynx	Franklin's Gull	Fringed Myotis	American White Pelican	Ruddy Duck
	Common Tern	Long-legged Myotis	Double-crested Cormorant	Osprey
TIER II: 72	Forster's Tern	Western Small-footed Myotis	Great Blue Heron	Red-tailed Hawk
Long-toed Salamander	Northern Saw-whet Owl	Northern Myotis	Snowy Egret	Rough-legged Hawk

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American Kestrel	Snowy Owl	Clark's Nutcracker	Western Tanager	Dusky Or Montane Shrew
Ruffed Grouse	Long-eared Owl	Black-billed Magpie	Black-headed Grosbeak	Water Shrew
Sharp-tailed Grouse	Short-eared Owl	American Crow	Lazuli Bunting	Little Brown Myotis
Sora	Common Nighthawk	Black-capped Chickadee	Dickcissel	American Pika
American Coot	Common Poorwill	Red-breasted Nuthatch	Spotted Towhee	Snowshoe Hare
Lesser Sandhill Crane	White-throated Swift	Rock Wren	American Tree Sparrow	Least Chipmunk
Killdeer	Calliope Hummingbird	House Wren	Chipping Sparrow	Yellow-pine Chipmunk
Black-necked Stilt	Rufous Hummingbird	Marsh Wren	Vesper Sparrow	Yellow-bellied Marmot
American Avocet	Belted Kingfisher	American Dipper	Sage Sparrow	Richardson's Ground Squirrel
Greater Yellowlegs	Red-naped Sapsucker	Ruby-crowned Kinglet	Savannah Sparrow	Columbian Ground Squirrel
Lesser Yellowlegs	Downy Woodpecker	Mountain Bluebird	Song Sparrow	Golden-mantled Ground Squirrel
Solitary Sandpiper	Hairy Woodpecker	Townsend's Solitaire	White-throated Sparrow	Red Squirrel
Willet	Northern Flicker	Swainson's Thrush	White-crowned Sparrow	Northern Pocket Gopher
Spotted Sandpiper	Western Wood-pewee	Hermit Thrush	Harris' Sparrow	American Beaver
Semipalmated Sandpiper	Willow Flycatcher	American Robin	Dark-eyed Junco	Deer Mouse
Western Sandpiper	Least Flycatcher	Gray Catbird	Lapland Longspur	Northern Grasshopper Mouse
Least Sandpiper	Dusky Flycatcher	Northern Mockingbird	Chestnut-collared Longspur	Bushy-tailed Woodrat
Baird's Sandpiper	Cordilleran Flycatcher	Sage Thrasher	Bobolink	Southern Red-backed Vole
Pectoral Sandpiper	Say's Phoebe	American Pipit	Red-winged Blackbird	Heather Vole
Dunlin	Western Kingbird	Bohemian Waxwing	Western Meadowlark	Meadow Vole
Long-billed Dowitcher	Eastern Kingbird	Cedar Waxwing	Yellow-headed Blackbird	Montane Vole
Common Snipe	Horned Lark	Northern Shrike	Brewer's Blackbird	Long-tailed Vole
Wilson's Phalarope	Tree Swallow	Warbling Vireo	Common Grackle	Prairie Vole
Ring-billed Gull	Violet-green Swallow	Red-eyed Vireo	Brown-headed Cowbird	Muskrat
California Gull	Northern Rough-winged Swallow	Yellow Warbler	Cassin's Finch	Western Jumping Mouse
Herring Gull	Bank Swallow	Yellow-rumped Warbler	House Finch	Common Porcupine
Glaucous Gull	Cliff Swallow	Northern Waterthrush	Common Redpoll	Coyote
Mourning Dove	Barn Swallow	Macgillivray's Warbler	American Goldfinch	Red Fox
Western Screech-Owl	Gray Jay	Common Yellowthroat	Evening Grosbeak	Black Bear
Great Horned Owl	Blue Jay	Wilson's Warbler	Masked Shrew	Ermine

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Long-tailed Weasel	Ruddy Turnstone
Mink	Sanderling
Striped Skunk	Stilt Sandpiper
Bobcat	Buff-breasted Sandpiper
Wapiti Or Elk	Short-billed Dowitcher
Mule Deer	Red-necked Phalarope
White-tailed Deer	Pomarine Jaeger
Moose	Bonaparte's Gull
Pronghorn	Rock Dove
Mountain Goat	Band-tailed Pigeon
Painted Turtle	Scissor-tailed Flycatcher
Racer	Gray-cheeked Thrush
Gopher Snake	European Starling
Western Terrestrial Garter Snake	Scarlet Tanager
	Rose-breasted Grosbeak
TIER IV: 32	House Sparrow
Great Egret	House Mouse
Mute Swan	Common Raccoon
Eurasian Wigeon	
Surf Scoter	
Broad-winged Hawk	
Gray Partridge	
Chukar	
Ring-necked Pheasant	
Wild Turkey	
Black-bellied Plover	
American Golden-plover	
Semipalmated Plover	
Whimbrel	
Hudsonian Godwit	

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Table 12. Deerlodge Valley Focus Area-Species Associations

TOTAL: 260	American Bittern	Brown Creeper	American Badger	Common Goldeneye
Group Breakdown Amphibians: 4 Birds: 189 Mammals: 60 Reptiles: 6	Black-crowned Night-heron	Western Bluebird	Northern River Otter	Barrow's Goldeneye
	White-faced Ibis	Veery	Rubber Boa	Bufflehead
	Canvasback	Loggerhead Shrike	Common Garter Snake	Common Merganser
	Hooded Merganser	Indigo Bunting	Western Rattlesnake	Red-breasted Merganser
	Turkey Vulture	Green-tailed Towhee		Ruddy Duck
TIER I: 10	Northern Harrier	Clay-colored Sparrow	TIER III: 177	Osprey
	Sharp-shinned Hawk	Brewer's Sparrow	Pied-billed Grebe	Rough-legged Hawk
	Northern Goshawk	Lark Bunting	Eared Grebe	American Kestrel
	Swainson's Hawk	Bullock's Oriole	American White Pelican	Ruffed Grouse
	Ferruginous Hawk	Preble's Shrew	Double-crested Cormorant	Sharp-tailed Grouse
Boreal Toad	Golden Eagle	Vagrant Shrew	Great Blue Heron	Virginia Rail
Northern Leopard Frog	Blue Grouse	Yuma Myotis	Cattle Egret	Sora
Common Loon	Greater Sandhill Crane	Long-eared Myotis	Tundra Swan	American Coot
Trumpeter Swan	Franklin's Gull	Fringed Myotis	Greater White-fronted Goose	Lesser Sandhill Crane
Harlequin Duck	Caspian Tern	Long-legged Myotis	Snow Goose	Killdeer
Bald Eagle	Common Tern	Western Small-footed Myotis	Canada Goose	Black-necked Stilt
Long-billed Curlew	Northern Pygmy-owl	Silver-haired Bat	Wood Duck	American Avocet
Black Tern	Great Gray Owl	Big Brown Bat	Green-winged Teal	Greater Yellowlegs
Townsend's Big-eared Bat	Northern Saw-whet Owl	Hoary Bat	Mallard	Lesser Yellowlegs
Lynx	Black-chinned Hummingbird	Mountain Cottontail	Northern Pintail	Solitary Sandpiper
TIER II: 64	Lewis' Woodpecker	White-tailed Jackrabbit	Blue-winged Teal	Willet
Long-toed Salamander	Williamson's Sapsucker	Northern Flying Squirrel	Cinnamon Teal	Spotted Sandpiper
Columbia Spotted Frog	Pileated Woodpecker	Water Vole	Northern Shoveler	Western Sandpiper
Horned Grebe	Hammond's Flycatcher	Sagebrush Vole	Gadwall	Least Sandpiper
Red-necked Grebe	White-breasted Nuthatch	American Marten	Greater Scaup	Baird's Sandpiper
Western Grebe	Pygmy Nuthatch	Fisher	Lesser Scaup	Pectoral Sandpiper

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Long-billed Dowitcher	Cliff Swallow	Macgillivray's Warbler	Masked Shrew	Striped Skunk
Common Snipe	Barn Swallow	Common Yellowthroat	Dusky Or Montane Shrew	Bobcat
Wilson's Phalarope	Gray Jay	Wilson's Warbler	Water Shrew	Wapiti Or Elk
Ring-billed Gull	Steller's Jay	Western Tanager	Little Brown Myotis	Mule Deer
California Gull	Clark's Nutcracker	Black-headed Grosbeak	Snowshoe Hare	White-tailed Deer
Herring Gull	Black-billed Magpie	Lazuli Bunting	Least Chipmunk	Moose
Mourning Dove	American Crow	Spotted Towhee	Yellow-pine Chipmunk	Pronghorn
Great Horned Owl	Black-capped Chickadee	American Tree Sparrow	Red-tailed Chipmunk	Racer
Common Nighthawk	Rock Wren	Chipping Sparrow	Yellow-bellied Marmot	Gopher Snake
White-throated Swift	House Wren	Vesper Sparrow	Columbian Ground Squirrel	Western Terrestrial Garter Snake
Calliope Hummingbird	Marsh Wren	Lark Sparrow	Golden-mantled Ground Squirrel	
Rufous Hummingbird	American Dipper	Savannah Sparrow	Red Squirrel	TIER IV: 8
Belted Kingfisher	Golden-crowned Kinglet	Song Sparrow	Northern Pocket Gopher	Gray Partridge
Red-naped Sapsucker	Ruby-crowned Kinglet	White-throated Sparrow	American Beaver	Ring-necked Pheasant
Downy Woodpecker	Mountain Bluebird	White-crowned Sparrow	Deer Mouse	Wild Turkey
Hairy Woodpecker	Townsend's Solitaire	Dark-eyed Junco	Bushy-tailed Woodrat	Rock Dove
Northern Flicker	Swainson's Thrush	Bobolink	Southern Red-backed Vole	European Starling
Western Wood-pewee	Hermit Thrush	Red-winged Blackbird	Heather Vole	House Sparrow
Willow Flycatcher	American Robin	Western Meadowlark	Meadow Vole	House Mouse
Least Flycatcher	Gray Catbird	Yellow-headed Blackbird	Montane Vole	Common Raccoon
Dusky Flycatcher	American Pipit	Brewer's Blackbird	Long-tailed Vole	
Cordilleran Flycatcher	Bohemian Waxwing	Common Grackle	Muskrat	
Say's Phoebe	Cedar Waxwing	Brown-headed Cowbird	Western Jumping Mouse	
Western Kingbird	Northern Shrike	Pine Grosbeak	Common Porcupine	
Eastern Kingbird	Warbling Vireo	Cassin's Finch	Coyote	
Horned Lark	Red-eyed Vireo	House Finch	Red Fox	
Tree Swallow	Yellow Warbler	Common Redpoll	Black Bear	
Violet-green Swallow	Yellow-rumped Warbler	Hoary Redpoll	Ermine	
Northern Rough-winged Swallow	Townsend's Warbler	American Goldfinch	Long-tailed Weasel	
Bank Swallow	Northern Waterthrush	Evening Grosbeak	Mink	

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Table 13. Flathead River Valley Focus Area-Species Associations

TOTAL: 344	TIER II: 86			
Group Breakdown Amphibians: 5 Birds: 269 Mammals: 63 Reptiles: 7	Long-toed Salamander	Caspian Tern	Veery	American Badger
	Pacific Treefrog	Common Tern	Loggerhead Shrike	Northern River Otter
	Columbia Spotted Frog	Forster's Tern	American Redstart	Northern Alligator Lizard
	Horned Grebe	Barn Owl	Yellow-breasted Chat	Western Skink
	Red-necked Grebe	Northern Pygmy-owl	Clay-colored Sparrow	Rubber Boa
	Western Grebe	Barred Owl	Field Sparrow	Common Garter Snake
	American Bittern	Great Gray Owl	Lark Bunting	
		Northern Saw-whet Owl	Grasshopper Sparrow	TIER III: 213
TIER I: 16	Black-crowned Night-heron	Black Swift	Bullock's Oriole	Pied-billed Grebe
Boreal Toad	Canvasback	Vaux's Swift	Gray-crowned Rosy-finch	Eared Grebe
Northern Leopard Frog	Redhead	Black-chinned Hummingbird	White-winged Crossbill	Clark's Grebe
Common Loon	Hooded Merganser	Anna's Hummingbird	Vagrant Shrew	American White Pelican
Trumpeter Swan	Turkey Vulture	Broad-tailed Hummingbird	Pygmy Shrew	Double-crested Cormorant
Bald Eagle	Northern Harrier	Lewis' Woodpecker	Yuma Myotis	Great Blue Heron
Columbian Sharp-tailed Grouse	Sharp-shinned Hawk	Red-headed Woodpecker	Long-eared Myotis	Tundra Swan
Long-billed Curlew	Cooper's Hawk	Williamson's Sapsucker	Long-legged Myotis	Greater White-fronted Goose
Black Tern	Northern Goshawk	Three-toed Woodpecker	California Myotis	Snow Goose
Flammulated Owl	Swainson's Hawk	Pileated Woodpecker	Silver-haired Bat	Ross' Goose
Black-backed Woodpecker	Ferruginous Hawk	Alder Flycatcher	Big Brown Bat	Canada Goose
Olive-sided Flycatcher	Golden Eagle	Hammond's Flycatcher	Hoary Bat	Wood Duck
Townsend's Big-eared Bat	Merlin	Pinyon Jay	Mountain Cottontail	Green-winged Teal
Northern Bog Lemming	Peregrine Falcon	Chestnut-backed Chickadee	Northern Flying Squirrel	Mallard
Gray Wolf	Prairie Falcon	White-breasted Nuthatch	Water Vole	Northern Pintail
Grizzly Bear	Blue Grouse	Pygmy Nuthatch	American Marten	Blue-winged Teal
Lynx	Upland Sandpiper	Brown Creeper	Fisher	Cinnamon Teal
	Marbled Godwit	Winter Wren	Least Weasel	Northern Shoveler
	Franklin's Gull	Western Bluebird	Wolverine	Gadwall

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American Wigeon	Semipalmated Sandpiper	Northern Flicker	Golden-crowned Kinglet	American Tree Sparrow
Ring-necked Duck	Western Sandpiper	Western Wood-pewee	Ruby-crowned Kinglet	Chipping Sparrow
Greater Scaup	Least Sandpiper	Willow Flycatcher	Mountain Bluebird	Vesper Sparrow
Lesser Scaup	White-rumped Sandpiper	Least Flycatcher	Townsend's Solitaire	Lark Sparrow
Long Tailed Duck	Baird's Sandpiper	Dusky Flycatcher	Swainson's Thrush	Savannah Sparrow
White-winged Scoter	Pectoral Sandpiper	Cordilleran Flycatcher	Hermit Thrush	Fox Sparrow
Common Goldeneye	Dunlin	Say's Phoebe	American Robin	Song Sparrow
Barrow's Goldeneye	Long-billed Dowitcher	Western Kingbird	Varied Thrush	Lincoln's Sparrow
Bufflehead	Common Snipe	Eastern Kingbird	Gray Catbird	Swamp Sparrow
Common Merganser	Wilson's Phalarope	Horned Lark	Northern Mockingbird	White-throated Sparrow
Red-breasted Merganser	Ring-billed Gull	Tree Swallow	American Pipit	White-crowned Sparrow
Ruddy Duck	California Gull	Violet-green Swallow	Bohemian Waxwing	Harris' Sparrow
Osprey	Herring Gull	Northern Rough-winged Swallow	Cedar Waxwing	Dark-eyed Junco
Red-tailed Hawk	Glaucous-winged Gull	Bank Swallow	Northern Shrike	Chestnut-collared Longspur
Rough-legged Hawk	Glaucous Gull	Cliff Swallow	Warbling Vireo	Snow Bunting
American Kestrel	Arctic Tern	Barn Swallow	Red-eyed Vireo	Bobolink
Gyr Falcon	Mourning Dove	Gray Jay	Cassin's Vireo	Red-winged Blackbird
Ruffed Grouse	Western Screech-owl	Steller's Jay	Orange-crowned Warbler	Western Meadowlark
Virginia Rail	Great Horned Owl	Blue Jay	Nashville Warbler	Yellow-headed Blackbird
Sora	Snowy Owl	Clark's Nutcracker	Yellow Warbler	Rusty Blackbird
American Coot	Long-eared Owl	Black-billed Magpie	Yellow-rumped Warbler	Brewer's Blackbird
Lesser Sandhill Crane	Short-eared Owl	American Crow	Townsend's Warbler	Common Grackle
Killdeer	Common Nighthawk	Common Raven	Northern Waterthrush	Brown-headed Cowbird
Black-necked Stilt	White-throated Swift	Black-capped Chickadee	Macgillivray's Warbler	Pine Grosbeak
American Avocet	Calliope Hummingbird	Mountain Chickadee	Common Yellowthroat	Purple Finch
Greater Yellowlegs	Rufous Hummingbird	Red-breasted Nuthatch	Wilson's Warbler	Cassin's Finch
Lesser Yellowlegs	Belted Kingfisher	Rock Wren	Western Tanager	House Finch
Solitary Sandpiper	Red-naped Sapsucker	House Wren	Black-headed Grosbeak	Red Crossbill
Willet	Downy Woodpecker	Marsh Wren	Lazuli Bunting	Common Redpoll
Spotted Sandpiper	Hairy Woodpecker	American Dipper	Spotted Towhee	Hoary Redpoll

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Pine Siskin	Ermine	Stilt Sandpiper
American Goldfinch	Long-tailed Weasel	Short-billed Dowitcher
Evening Grosbeak	Mink	Red-necked Phalarope
Masked Shrew	Striped Skunk	Bonaparte's Gull
Dusky Or Montane Shrew	Bobcat	Thayer's Gull
Water Shrew	Mountain Lion	Rock Dove
Little Brown Myotis	Wapiti Or Elk	Scissor-tailed Flycatcher
Desert Cottontail	Mule Deer	European Starling
Snowshoe Hare	White-tailed Deer	Magnolia Warbler
Least Chipmunk	Moose	Mourning Warbler
Yellow-pine Chipmunk	Bighorn Sheep	Scarlet Tanager
Red-tailed Chipmunk	Painted Turtle	Rose-breasted Grosbeak
Yellow-bellied Marmot	Gopher Snake	House Sparrow
Richardson's Ground Squirrel	Western Terrestrial Garter Snake	House Mouse
Columbian Ground Squirrel		Common Raccoon
Golden-mantled Ground Squirrel	TIER IV: 29	
Red Squirrel	Green Heron	
Northern Pocket Gopher	Brant	
American Beaver	Eurasian Wigeon	
Deer Mouse	Surf Scoter	
Bushy-tailed Woodrat	Gray Partridge	
Southern Red-backed Vole	Chukar	
Heather Vole	Ring-necked Pheasant	
Meadow Vole	Wild Turkey	
Long-tailed Vole	Black-bellied Plover	
Muskrat	American Golden-plover	
Common Porcupine	Semipalmated Plover	
Coyote	Whimbrel	
Red Fox	Hudsonian Godwit	
Black Bear	Sanderling	

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Table 14. Little Belt Foothills Focus Area-Species Associations

TOTAL: 293	TIER II: 72			
Group Breakdown Amphibians: 9 Birds: 204 Mammals: 68 Reptiles: 12	Tiger Salamander	Lewis' Woodpecker	Fringed Myotis	Great Blue Heron
	Great Plains Toad	Pinyon Jay	Long-legged Myotis	Tundra Swan
	Woodhouse's Toad	White-breasted Nuthatch	Western Small-footed Myotis	Snow Goose
	Plains Spadefoot	Brown Creeper	Silver-haired Bat	Ross' Goose
	Columbia Spotted Frog	Canyon Wren	Big Brown Bat	Canada Goose
	Western Grebe	Eastern Bluebird	Hoary Bat	Green-winged Teal
	American Bittern	Western Bluebird	Mountain Cottontail	Mallard
	Turkey Vulture	Veery	White-tailed Jackrabbit	Northern Pintail
	Northern Harrier	Sprague's Pipit	Olive-backed Pocket Mouse	Blue-winged Teal
	Sharp-shinned Hawk	Loggerhead Shrike	Ord's Kangaroo Rat	Cinnamon Teal
TIER I: 13 Boreal Toad Northern Leopard Frog Bald Eagle Sage-grouse Mountain Plover Long-billed Curlew Black Tern Burrowing Owl Townsend's Big-eared Bat Black-tailed Prairie Dog Black-footed Ferret Western Hognose Snake Milk Snake	Cooper's Hawk	American Redstart	Sagebrush Vole	Northern Shoveler
	Northern Goshawk	Yellow-breasted Chat	Swift Fox	Gadwall
	Swainson's Hawk	Clay-colored Sparrow	Least Weasel	American Wigeon
	Ferruginous Hawk	Brewer's Sparrow	American Badger	Ring-necked Duck
	Golden Eagle	Field Sparrow	Short-horned Lizard	Lesser Scaup
	Merlin	Lark Bunting	Sagebrush Lizard	Common Goldeneye
	Peregrine Falcon	Baird's Sparrow	Rubber Boa	Bufflehead
	Prairie Falcon	Grasshopper Sparrow	Common Garter Snake	Common Merganser
	Blue Grouse	Mccown's Longspur	Western Rattlesnake	Ruddy Duck
	Greater Sandhill Crane	Baltimore Oriole		Osprey
	Upland Sandpiper	Bullock's Oriole	TIER III: 195	Red-tailed Hawk
	Marbled Godwit	Preble's Shrew	Boreal Chorus Frog	Rough-legged Hawk
	Franklin's Gull	Vagrant Shrew	Great Basin Spadefoot	American Kestrel
	Northern Pygmy-owl	Dwarf Shrew	Pied-billed Grebe	Gyr Falcon
	Great Gray Owl	Hayden's Shrew	Eared Grebe	Ruffed Grouse
	Northern Saw-whet Owl	Yuma Myotis	American White Pelican	Sharp-tailed Grouse
		Long-eared Myotis	Double-crested Cormorant	Virginia Rail

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Sora	Hairy Woodpecker	Ruby-crowned Kinglet	Lark Sparrow	Snowshoe Hare
American Coot	Northern Flicker	Mountain Bluebird	Savannah Sparrow	Least Chipmunk
Killdeer	Western Wood-pewee	Townsend's Solitaire	Song Sparrow	Yellow-pine Chipmunk
American Avocet	Willow Flycatcher	Swainson's Thrush	Lincoln's Sparrow	Yellow-bellied Marmot
Greater Yellowlegs	Least Flycatcher	Hermit Thrush	White-crowned Sparrow	Richardson's Ground Squirrel
Lesser Yellowlegs	Dusky Flycatcher	American Robin	Harris' Sparrow	Columbian Ground Squirrel
Solitary Sandpiper	Cordilleran Flycatcher	Gray Catbird	Dark-eyed Junco	Thirteen-lined Ground Squirrel
Willet	Say's Phoebe	Northern Mockingbird	Lapland Longspur	Red Squirrel
Spotted Sandpiper	Western Kingbird	Brown Thrasher	Chestnut-collared Longspur	Northern Pocket Gopher
Least Sandpiper	Eastern Kingbird	American Pipit	Bobolink	American Beaver
Pectoral Sandpiper	Horned Lark	Bohemian Waxwing	Red-winged Blackbird	Western Harvest Mouse
Long-billed Dowitcher	Tree Swallow	Cedar Waxwing	Western Meadowlark	Deer Mouse
Common Snipe	Violet-green Swallow	Northern Shrike	Yellow-headed Blackbird	Northern Grasshopper Mouse
Wilson's Phalarope	Northern Rough-winged Swallow	Warbling Vireo	Brewer's Blackbird	Bushy-tailed Woodrat
Ring-billed Gull	Bank Swallow	Red-eyed Vireo	Common Grackle	Southern Red-backed Vole
California Gull	Cliff Swallow	Orange-crowned Warbler	Brown-headed Cowbird	Meadow Vole
Herring Gull	Barn Swallow	Yellow Warbler	Pine Grosbeak	Montane Vole
Mourning Dove	Gray Jay	Yellow-rumped Warbler	Cassin's Finch	Long-tailed Vole
Eastern Screech-owl	Blue Jay	Ovenbird	House Finch	Prairie Vole
Western Screech-owl	Clark's Nutcracker	Northern Waterthrush	Red Crossbill	Muskrat
Great Horned Owl	Black-billed Magpie	Macgillivray's Warbler	Common Redpoll	Western Jumping Mouse
Snowy Owl	American Crow	Common Yellowthroat	Hoary Redpoll	Common Porcupine
Long-eared Owl	Black-capped Chickadee	Wilson's Warbler	Pine Siskin	Coyote
Short-eared Owl	Mountain Chickadee	Western Tanager	American Goldfinch	Red Fox
Common Nighthawk	Red-breasted Nuthatch	Black-headed Grosbeak	Evening Grosbeak	Black Bear
Common Poorwill	Rock Wren	Lazuli Bunting	Masked Shrew	Ermine
White-throated Swift	House Wren	Spotted Towhee	Dusky Or Montane Shrew	Long-tailed Weasel
Belted Kingfisher	Marsh Wren	American Tree Sparrow	Water Shrew	Mink
Red-naped Sapsucker	American Dipper	Chipping Sparrow	Little Brown Myotis	Striped Skunk
Downy Woodpecker	Golden-crowned Kinglet	Vesper Sparrow	Desert Cottontail	Bobcat

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Wapiti Or Elk
Mule Deer
White-tailed Deer
Moose
Pronghorn
Mountain Goat
Bighorn Sheep
Painted Turtle
Racer
Gopher Snake
Western Terrestrial Garter Snake
Plains Garter Snake
TIER IV: 10
Gray Partridge
Ring-necked Pheasant
Wild Turkey
Red-necked Phalarope
Bonaparte's Gull
Rock Dove
European Starling
House Sparrow
House Mouse
Common Raccoon

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Table 15. North Tobacco Root Mountains and Foothills Focus Area-Species Associations

TOTAL: 244	Ferruginous Hawk	Western Small-footed Myotis	Mallard	Spotted Sandpiper
Group Breakdown Amphibians: 5 Birds: 170 Mammals: 63 Reptiles: 6	Golden Eagle	Silver-haired Bat	Northern Pintail	Semipalmated Sandpiper
	Merlin	Big Brown Bat	Blue-winged Teal	Western Sandpiper
	Prairie Falcon	Hoary Bat	Cinnamon Teal	Least Sandpiper
	Blue Grouse	Mountain Cottontail	Northern Shoveler	Baird's Sandpiper
	Greater Sandhill Crane	White-tailed Jackrabbit	Ring-necked Duck	Pectoral Sandpiper
	Northern Saw-whet Owl	Northern Flying Squirrel	Lesser Scaup	Long-billed Dowitcher
TIER I: 6	Alder Flycatcher	Olive-backed Pocket Mouse	Common Goldeneye	Common Snipe
	Hammond's Flycatcher	White-footed Mouse	Barrow's Goldeneye	Wilson's Phalarope
	White-breasted Nuthatch	Sagebrush Vole	Bufflehead	Ring-billed Gull
	Canyon Wren	American Marten	Common Merganser	California Gull
	Western Bluebird	American Badger	Red-breasted Merganser	Mourning Dove
	Veery	Northern River Otter	Ruddy Duck	Eastern Screech-owl
Boreal Toad Bald Eagle Flammulated Owl Townsend's Big-eared Bat Grizzly Bear Lynx	Loggerhead Shrike	Rubber Boa	Osprey	Great Horned Owl
	Clay-colored Sparrow	Western Rattlesnake	Red-tailed Hawk	Short-eared Owl
	Brewer's Sparrow		Rough-legged Hawk	White-throated Swift
	Baltimore Oriole	TIER III: 168	American Kestrel	Calliope Hummingbird
	Bullock's Oriole	Boreal Chorus Frog	Ruffed Grouse	Rufous Hummingbird
	Preble's Shrew	Pied-billed Grebe	Virginia Rail	Belted Kingfisher
Long-toed Salamander Tiger Salamander Tailed Frog Western Grebe Turkey Vulture Northern Harrier Sharp-shinned Hawk Cooper's Hawk Northern Goshawk Swainson's Hawk	Vagrant Shrew	Eared Grebe	Sora	Red-naped Sapsucker
	Merriam's Shrew	Clark's Grebe	American Coot	Downy Woodpecker
	Pygmy Shrew	American White Pelican	Lesser Sandhill Crane	Hairy Woodpecker
	Hayden's Shrew	Double-crested Cormorant	Killdeer	Northern Flicker
	Yuma Myotis	Great Blue Heron	American Avocet	Western Wood-pewee
	Long-eared Myotis	Cattle Egret	Greater Yellowlegs	Willow Flycatcher
	Fringed Myotis	Canada Goose	Lesser Yellowlegs	Least Flycatcher
	Long-legged Myotis	Green-winged Teal	Solitary Sandpiper	Dusky Flycatcher

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Cordilleran Flycatcher	Northern Shrike	Common Redpoll	Ermine	Scarlet Tanager
Western Kingbird	Warbling Vireo	American Goldfinch	Long-tailed Weasel	Rose-breasted Grosbeak
Eastern Kingbird	Red-eyed Vireo	Evening Grosbeak	Mink	House Sparrow
Horned Lark	Yellow Warbler	Masked Shrew	Striped Skunk	Common Raccoon
Tree Swallow	Yellow-rumped Warbler	Dusky Or Montane Shrew	Bobcat	
Violet-green Swallow	Ovenbird	Water Shrew	Wapiti Or Elk	
Northern Rough-winged Swallow	Macgillivray's Warbler	Little Brown Myotis	Mule Deer	
Bank Swallow	Common Yellowthroat	Snowshoe Hare	White-tailed Deer	
Cliff Swallow	Wilson's Warbler	Least Chipmunk	Moose	
Barn Swallow	Western Tanager	Yellow-pine Chipmunk	Pronghorn	
Blue Jay	Black-headed Grosbeak	Yellow-bellied Marmot	Painted Turtle	
Clark's Nutcracker	Lazuli Bunting	Richardson's Ground Squirrel	Racer	
Black-billed Magpie	Spotted Towhee	Columbian Ground Squirrel	Gopher Snake	
American Crow	American Tree Sparrow	Golden-mantled Ground Squirrel	Western Terrestrial Garter Snake	
Black-capped Chickadee	Chipping Sparrow	Red Squirrel		
Red-breasted Nuthatch	Vesper Sparrow	Northern Pocket Gopher	TIER IV: 18	
Rock Wren	Savannah Sparrow	American Beaver	Red-throated Loon	
House Wren	Song Sparrow	Deer Mouse	Great Egret	
Marsh Wren	White-crowned Sparrow	Bushy-tailed Woodrat	Broad-winged Hawk	
American Dipper	Harris' Sparrow	Southern Red-backed Vole	Gray Partridge	
Ruby-crowned Kinglet	Dark-eyed Junco	Heather Vole	Ring-necked Pheasant	
Mountain Bluebird	Bobolink	Meadow Vole	Wild Turkey	
Townsend's Solitaire	Red-winged Blackbird	Montane Vole	American Golden-plover	
Swainson's Thrush	Western Meadowlark	Long-tailed Vole	Semipalmated Plover	
Hermit Thrush	Yellow-headed Blackbird	Muskrat	Buff-breasted Sandpiper	
American Robin	Brewer's Blackbird	Western Jumping Mouse	Short-billed Dowitcher	
Sage Thrasher	Common Grackle	Common Porcupine	Red-necked Phalarope	
American Pipit	Brown-headed Cowbird	Coyote	Rock Dove	
Bohemian Waxwing	Cassin's Finch	Red Fox	Gray-cheeked Thrush	
Cedar Waxwing	House Finch	Black Bear	European Starling	

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Table 16. Rocky Mountain Front Foothills Focus Area-Species Associations

TOTAL: 362	Western Hognose Snake	Prairie Falcon	Veery	Silver-haired Bat
Group Breakdown Amphibians: 9 Birds: 270 Mammals: 73 Reptiles: 10	TIER II: 95	Blue Grouse	Sprague's Pipit	Big Brown Bat
	Long-toed Salamander	Greater Sandhill Crane	Loggerhead Shrike	Hoary Bat
	Tiger Salamander	Upland Sandpiper	Black-and-white Warbler	Mountain Cottontail
	Tailed Frog	Marbled Godwit	American Redstart	White-tailed Jackrabbit
	Great Plains Toad	Franklin's Gull	Yellow-breasted Chat	Northern Flying Squirrel
	Plains Spadefoot	Caspian Tern	Indigo Bunting	Sagebrush Vole
	Columbia Spotted Frog	Common Tern	Green-tailed Towhee	Swift Fox
TIER I: 18	Horned Grebe	Forster's Tern	Clay-colored Sparrow	American Marten
Boreal Toad	Red-necked Grebe	Black-billed Cuckoo	Brewer's Sparrow	Least Weasel
Northern Leopard Frog	Western Grebe	Northern Pygmy-owl	Field Sparrow	American Badger
Common Loon	American Bittern	Great Gray Owl	Lark Bunting	Northern River Otter
Trumpeter Swan	Black-crowned Night-heron	Northern Saw-whet Owl	Baird's Sparrow	Short-horned Lizard
Harlequin Duck	White-faced Ibis	Black-chinned Hummingbird	Grasshopper Sparrow	Rubber Boa
Bald Eagle	Canvasback	Broad-tailed Hummingbird	Le Conte's Sparrow	Common Garter Snake
Piping Plover	Redhead	Lewis' Woodpecker	Mccown's Longspur	Western Rattlesnake
Mountain Plover	Hooded Merganser	Pileated Woodpecker	Baltimore Oriole	TIER III: 219
Long-billed Curlew	Turkey Vulture	Alder Flycatcher	Bullock's Oriole	Boreal Chorus Frog
Black Tern	Northern Harrier	Hammond's Flycatcher	Preble's Shrew	Pied-billed Grebe
Flammulated Owl	Sharp-shinned Hawk	Pinyon Jay	Vagrant Shrew	Eared Grebe
Burrowing Owl	Cooper's Hawk	White-breasted Nuthatch	Dwarf Shrew	Clark's Grebe
Townsend's Big-eared Bat	Northern Goshawk	Pygmy Nuthatch	Pygmy Shrew	American White Pelican
Black-tailed Prairie Dog	Swainson's Hawk	Brown Creeper	Yuma Myotis	Double-crested Cormorant
Northern Bog Lemming	Ferruginous Hawk	Canyon Wren	Long-eared Myotis	Great Blue Heron
Grizzly Bear	Golden Eagle	Winter Wren	Fringed Myotis	Snowy Egret
Lynx	Merlin	Eastern Bluebird	Long-legged Myotis	Cattle Egret
American Bison	Peregrine Falcon	Western Bluebird	Western Small-footed Myotis	Tundra Swan

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Greater White-fronted Goose	Sharp-tailed Grouse	Long-eared Owl	Clark's Nutcracker	Ovenbird
Snow Goose	Virginia Rail	Short-eared Owl	Black-billed Magpie	Northern Waterthrush
Ross' Goose	Sora	Common Nighthawk	American Crow	Macgillivray's Warbler
Canada Goose	American Coot	Common Poorwill	Black-capped Chickadee	Common Yellowthroat
Wood Duck	Killdeer	White-throated Swift	Mountain Chickadee	Wilson's Warbler
Green-winged Teal	Black-necked Stilt	Calliope Hummingbird	Red-breasted Nuthatch	Western Tanager
Mallard	American Avocet	Rufous Hummingbird	Rock Wren	Black-headed Grosbeak
Northern Pintail	Greater Yellowlegs	Belted Kingfisher	House Wren	Lazuli Bunting
Blue-winged Teal	Lesser Yellowlegs	Red-naped Sapsucker	Marsh Wren	Spotted Towhee
Cinnamon Teal	Solitary Sandpiper	Downy Woodpecker	American Dipper	American Tree Sparrow
Northern Shoveler	Willet	Hairy Woodpecker	Golden-crowned Kinglet	Chipping Sparrow
Gadwall	Spotted Sandpiper	Northern Flicker	Ruby-crowned Kinglet	Vesper Sparrow
American Wigeon	Semipalmated Sandpiper	Western Wood-pewee	Mountain Bluebird	Lark Sparrow
Ring-necked Duck	Western Sandpiper	Willow Flycatcher	Townsend's Solitaire	Savannah Sparrow
Greater Scaup	Least Sandpiper	Least Flycatcher	Swainson's Thrush	Fox Sparrow
Lesser Scaup	Baird's Sandpiper	Dusky Flycatcher	Hermit Thrush	Song Sparrow
Long Tailed Duck	Pectoral Sandpiper	Cordilleran Flycatcher	American Robin	Lincoln's Sparrow
White-winged Scoter	Dunlin	Say's Phoebe	Gray Catbird	White-crowned Sparrow
Common Goldeneye	Long-billed Dowitcher	Western Kingbird	Northern Mockingbird	Harris' Sparrow
Barrow's Goldeneye	Common Snipe	Eastern Kingbird	Brown Thrasher	Dark-eyed Junco
Bufflehead	Wilson's Phalarope	Horned Lark	American Pipit	Lapland Longspur
Common Merganser	Ring-billed Gull	Tree Swallow	Bohemian Waxwing	Chestnut-collared Longspur
Red-breasted Merganser	California Gull	Violet-green Swallow	Cedar Waxwing	Snow Bunting
Ruddy Duck	Herring Gull	Northern Rough-winged Swallow	Northern Shrike	Bobolink
Osprey	Glaucous Gull	Bank Swallow	Warbling Vireo	Red-winged Blackbird
Red-tailed Hawk	Mourning Dove	Cliff Swallow	Red-eyed Vireo	Western Meadowlark
Rough-legged Hawk	Eastern Screech-owl	Barn Swallow	Orange-crowned Warbler	Yellow-headed Blackbird
American Kestrel	Western Screech-owl	Gray Jay	Yellow Warbler	Rusty Blackbird
Gyr Falcon	Great Horned Owl	Steller's Jay	Yellow-rumped Warbler	Brewer's Blackbird
Ruffed Grouse	Snowy Owl	Blue Jay	Townsend's Warbler	Common Grackle

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		TIER IV: 29
Brown-headed Cowbird	Bushy-tailed Woodrat	Great Egret
Pine Grosbeak	Southern Red-backed Vole	Green Heron
Cassin's Finch	Heather Vole	Brant
House Finch	Meadow Vole	Eurasian Wigeon
Red Crossbill	Montane Vole	Black Scoter
Common Redpoll	Long-tailed Vole	Surf Scoter
Hoary Redpoll	Muskrat	Gray Partridge
Pine Siskin	Western Jumping Mouse	Ring-necked Pheasant
American Goldfinch	Common Porcupine	Wild Turkey
Evening Grosbeak	Coyote	Black-bellied Plover
Masked Shrew	Red Fox	American Golden-plover
Dusky Or Montane Shrew	Black Bear	Semipalmated Plover
Water Shrew	Ermine	Whimbrel
Little Brown Myotis	Long-tailed Weasel	Hudsonian Godwit
American Pika	Mink	Ruddy Turnstone
Desert Cottontail	Striped Skunk	Red Knot
Snowshoe Hare	Bobcat	Sanderling
Least Chipmunk	Wapiti Or Elk	Stilt Sandpiper
Yellow-pine Chipmunk	Mule Deer	Short-billed Dowitcher
Yellow-bellied Marmot	White-tailed Deer	Red-necked Phalarope
Richardson's Ground Squirrel	Moose	Red Phalarope
Columbian Ground Squirrel	Pronghorn	Bonaparte's Gull
Thirteen-lined Ground Squirrel	Mountain Goat	Rock Dove
Golden-mantled Ground Squirrel	Bighorn Sheep	European Starling
Red Squirrel	Painted Turtle	Palm Warbler
Northern Pocket Gopher	Racer	Blackpoll Warbler
American Beaver	Gopher Snake	House Sparrow
Western Harvest Mouse	Western Terrestrial Garter Snake	House Mouse
Deer Mouse	Plains Garter Snake	Common Raccoon
Northern Grasshopper Mouse		

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Table 17. South Elkhorn Mountains Focus Area-Species Associations

TOTAL: 242	Swainson's Hawk	Yuma Myotis	Great Blue Heron	Least Sandpiper
Group Breakdown Amphibians: 9 Birds: 162 Mammals: 69 Reptiles: 5	Golden Eagle	Long-eared Myotis	Canada Goose	Baird's Sandpiper
	Merlin	Long-legged Myotis	Green-winged Teal	Pectoral Sandpiper
	Prairie Falcon	California Myotis	Mallard	Long-billed Dowitcher
	Blue Grouse	Western Small-footed Myotis	Northern Pintail	Common Snipe
	Great Gray Owl	Silver-haired Bat	Blue-winged Teal	Wilson's Phalarope
	Boreal Owl	Big Brown Bat	Cinnamon Teal	Ring-billed Gull
TIER I: 7	Northern Saw-whet Owl	Hoary Bat	Bufflehead	California Gull
	Alder Flycatcher	Mountain Cottontail	Common Merganser	Mourning Dove
	Hammond's Flycatcher	White-tailed Jackrabbit	Red-breasted Merganser	Great Horned Owl
	White-breasted Nuthatch	Northern Flying Squirrel	Ruddy Duck	Short-eared Owl
	Brown Creeper	Olive-backed Pocket Mouse	Osprey	White-throated Swift
	Winter Wren	White-footed Mouse	Red-tailed Hawk	Calliope Hummingbird
Northern Leopard Frog Bald Eagle Black-backed Woodpecker Townsend's Big-eared Bat Pallid Bat Gray Wolf Lynx	Western Bluebird	American Marten	Rough-legged Hawk	Rufous Hummingbird
	Veery	Fisher	American Kestrel	Belted Kingfisher
	Loggerhead Shrike	Least Weasel	Spruce Grouse	Downy Woodpecker
	Clay-colored Sparrow	Wolverine	Ruffed Grouse	Hairy Woodpecker
	Brewer's Sparrow	American Badger	Sora	Northern Flicker
	Baltimore Oriole	Northern River Otter	American Coot	Western Wood-pewee
TIER II: 56	Bullock's Oriole	Western Rattlesnake	Lesser Sandhill Crane	Willow Flycatcher
	Black Rosy-finch	TIER III: 168	Killdeer	Dusky Flycatcher
	Gray-crowned Rosy-finch		American Avocet	Say's Phoebe
	White-winged Crossbill	Boreal Chorus Frog	Greater Yellowlegs	Western Kingbird
	Preble's Shrew	Pied-billed Grebe	Lesser Yellowlegs	Eastern Kingbird
	Vagrant Shrew	Eared Grebe	Spotted Sandpiper	Horned Lark
Cooper's Hawk Northern Goshawk	Merriam's Shrew	American White Pelican	Semipalmated Sandpiper	Tree Swallow
	Hayden's Shrew	Double-crested Cormorant	Western Sandpiper	Violet-green Swallow

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Northern Rough-winged Swallow	Yellow Warbler	House Finch	Coyote	House Sparrow
Bank Swallow	Yellow-rumped Warbler	Common Redpoll	Red Fox	Common Raccoon
Cliff Swallow	Townsend's Warbler	American Goldfinch	Black Bear	
Barn Swallow	Northern Waterthrush	Evening Grosbeak	Ermine	
Gray Jay	Macgillivray's Warbler	Masked Shrew	Long-tailed Weasel	
Steller's Jay	Common Yellowthroat	Dusky Or Montane Shrew	Mink	
Blue Jay	Wilson's Warbler	Water Shrew	Striped Skunk	
Clark's Nutcracker	Western Tanager	Little Brown Myotis	Bobcat	
Black-billed Magpie	Black-headed Grosbeak	American Pika	Mountain Lion	
American Crow	Lazuli Bunting	Snowshoe Hare	Wapiti Or Elk	
Common Raven	Spotted Towhee	Least Chipmunk	Mule Deer	
Black-capped Chickadee	American Tree Sparrow	Yellow-pine Chipmunk	White-tailed Deer	
Mountain Chickadee	Chipping Sparrow	Red-tailed Chipmunk	Moose	
Red-breasted Nuthatch	Vesper Sparrow	Yellow-bellied Marmot	Pronghorn	
Rock Wren	Savannah Sparrow	Richardson's Ground Squirrel	Mountain Goat	
House Wren	Song Sparrow	Columbian Ground Squirrel	Painted Turtle	
American Dipper	White-throated Sparrow	Golden-mantled Ground Squirrel	Racer	
Golden-crowned Kinglet	White-crowned Sparrow	Red Squirrel	Gopher Snake	
Ruby-crowned Kinglet	Harris' Sparrow	Northern Pocket Gopher	Western Terrestrial Garter Snake	
Mountain Bluebird	Dark-eyed Junco	American Beaver		
Townsend's Solitaire	Snow Bunting	Deer Mouse	TIER IV: 11	
Swainson's Thrush	Bobolink	Bushy-tailed Woodrat	Gray Partridge	
Hermit Thrush	Red-winged Blackbird	Southern Red-backed Vole	Ring-necked Pheasant	
American Robin	Western Meadowlark	Heather Vole	Wild Turkey	
Gray Catbird	Yellow-headed Blackbird	Meadow Vole	Semipalmated Plover	
Sage Thrasher	Brewer's Blackbird	Montane Vole	Stilt Sandpiper	
American Pipit	Common Grackle	Long-tailed Vole	Rock Dove	
Bohemian Waxwing	Brown-headed Cowbird	Muskrat	European Starling	
Cedar Waxwing	Pine Grosbeak	Western Jumping Mouse	Scarlet Tanager	
Red-eyed Vireo	Cassin's Finch	Common Porcupine	Rose-breasted Grosbeak	

14475 **Table 18. Southwest Montana Intermontane Basins & Valleys Focus Area-Species Associations**

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TOTAL: 296	Horned Grebe	Western Bluebird	White-footed Mouse	Mallard
Group Breakdown Amphibians: 5 Birds: 211 Mammals: 72 Reptiles: 8	Western Grebe	Veery	Sagebrush Vole	Northern Pintail
	American Bittern	Loggerhead Shrike	American Marten	Blue-winged Teal
	Black-crowned Night-heron	Clay-colored Sparrow	American Badger	Cinnamon Teal
	White-faced Ibis	Brewer's Sparrow	Western Spotted Skunk	Northern Shoveler
	Hooded Merganser	Baltimore Oriole	Northern River Otter	Gadwall
	Turkey Vulture	Bullock's Oriole	Short-horned Lizard	Ring-necked Duck
	Northern Harrier	Preble's Shrew	Sagebrush Lizard	Lesser Scaup
TIER I: 13	Sharp-shinned Hawk	Vagrant Shrew	Rubber Boa	White-winged Scoter
Boreal Toad Common Loon Trumpeter Swan Bald Eagle Sage-grouse Long-billed Curlew Flammulated Owl Townsend's Big-eared Bat Pygmy Rabbit Great Basin Pocket Mouse Gray Wolf Grizzly Bear Lynx	Cooper's Hawk	Merriam's Shrew	Western Rattlesnake	Common Goldeneye
	Northern Goshawk	Pygmy Shrew		Barrow's Goldeneye
	Swainson's Hawk	Hayden's Shrew	TIER III: 185	Bufflehead
	Ferruginous Hawk	Yuma Myotis	Boreal Chorus Frog	Common Merganser
	Golden Eagle	Long-eared Myotis	Pied-billed Grebe	Red-breasted Merganser
	Merlin	Fringed Myotis	Eared Grebe	Ruddy Duck
	Prairie Falcon	Long-legged Myotis	Clark's Grebe	Osprey
	Blue Grouse	Western Small-footed Myotis	American White Pelican	Red-tailed Hawk
	Greater Sandhill Crane	Silver-haired Bat	Double-crested Cormorant	Rough-legged Hawk
	Upland Sandpiper	Big Brown Bat	Great Blue Heron	American Kestrel
	Franklin's Gull	Hoary Bat	Cattle Egret	Ruffed Grouse
	Northern Saw-whet Owl	Mountain Cottontail	Tundra Swan	Virginia Rail
	Alder Flycatcher	White-tailed Jackrabbit	Greater White-fronted Goose	Sora
	Hammond's Flycatcher	Black-tailed Jackrabbit	Snow Goose	American Coot
TIER II: 67	Cassin's Kingbird	Uinta Ground Squirrel	Ross' Goose	Lesser Sandhill Crane
Long-toed Salamander Tiger Salamander Tailed Frog	Pinyon Jay	Wyoming Ground Squirrel	Canada Goose	Killdeer
	White-breasted Nuthatch	Northern Flying Squirrel	Wood Duck	Black-necked Stilt
	Canyon Wren	Idaho Pocket Gopher	Green-winged Teal	American Avocet

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Greater Yellowlegs	Dusky Flycatcher	Northern Mockingbird	Red-winged Blackbird	Meadow Vole
Lesser Yellowlegs	Cordilleran Flycatcher	Sage Thrasher	Western Meadowlark	Montane Vole
Solitary Sandpiper	Say's Phoebe	American Pipit	Yellow-headed Blackbird	Long-tailed Vole
Willet	Western Kingbird	Bohemian Waxwing	Brewer's Blackbird	Muskrat
Spotted Sandpiper	Eastern Kingbird	Cedar Waxwing	Common Grackle	Western Jumping Mouse
Least Sandpiper	Horned Lark	Northern Shrike	Brown-headed Cowbird	Common Porcupine
Baird's Sandpiper	Tree Swallow	Warbling Vireo	Cassin's Finch	Coyote
Long-billed Dowitcher	Violet-green Swallow	Red-eyed Vireo	House Finch	Red Fox
Common Snipe	Northern Rough-winged Swallow	Yellow Warbler	Common Redpoll	Black Bear
Wilson's Phalarope	Bank Swallow	Yellow-rumped Warbler	American Goldfinch	Ermine
Ring-billed Gull	Cliff Swallow	Ovenbird	Evening Grosbeak	Long-tailed Weasel
California Gull	Barn Swallow	Northern Waterthrush	Masked Shrew	Mink
Herring Gull	Gray Jay	Macgillivray's Warbler	Dusky Or Montane Shrew	Striped Skunk
Mourning Dove	Blue Jay	Common Yellowthroat	Water Shrew	Bobcat
Western Screech-owl	Clark's Nutcracker	Wilson's Warbler	Little Brown Myotis	Wapiti Or Elk
Great Horned Owl	Black-billed Magpie	Western Tanager	Snowshoe Hare	Mule Deer
Short-eared Owl	American Crow	Black-headed Grosbeak	Least Chipmunk	White-tailed Deer
Common Nighthawk	Black-capped Chickadee	Lazuli Bunting	Yellow-pine Chipmunk	Moose
Common Poorwill	Red-breasted Nuthatch	Spotted Towhee	Red-tailed Chipmunk	Pronghorn
White-throated Swift	Rock Wren	American Tree Sparrow	Yellow-bellied Marmot	Painted Turtle
Calliope Hummingbird	House Wren	Chipping Sparrow	Richardson's Ground Squirrel	Racer
Rufous Hummingbird	Marsh Wren	Vesper Sparrow	Columbian Ground Squirrel	Gopher Snake
Belted Kingfisher	American Dipper	Sage Sparrow	Golden-mantled Ground Squirrel	Western Terrestrial Garter Snake
Red-naped Sapsucker	Ruby-crowned Kinglet	Savannah Sparrow	Red Squirrel	
Downy Woodpecker	Mountain Bluebird	Song Sparrow	Northern Pocket Gopher	TIER IV: 31
Hairy Woodpecker	Townsend's Solitaire	Lincoln's Sparrow	American Beaver	Red-throated Loon
Northern Flicker	Swainson's Thrush	White-crowned Sparrow	Deer Mouse	Little Blue Heron
Western Wood-pewee	Hermit Thrush	Harris' Sparrow	Bushy-tailed Woodrat	Wood Stork
Willow Flycatcher	American Robin	Dark-eyed Junco	Southern Red-backed Vole	Eurasian Wigeon
Least Flycatcher	Gray Catbird	Bobolink	Heather Vole	Black Scoter

Surf Scoter
Gray Partridge
Chukar
Ring-necked Pheasant
American Golden-plover
Semipalmated Plover
Whimbrel
Ruddy Turnstone
Red Knot
Sanderling
Stilt Sandpiper
Short-billed Dowitcher
Red-necked Phalarope
Red Phalarope
Pomarine Jaeger
Bonaparte's Gull
Rock Dove
Scissor-tailed Flycatcher
European Starling
Pine Warbler
Blackpoll Warbler
Scarlet Tanager
Rose-breasted Grosbeak
House Sparrow
House Mouse
Common Raccoon

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14484 **Table 19. Upper Yellowstone Valley Focus Area-Species Associations**

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TOTAL: 265	Turkey Vulture	Clay-colored Sparrow	Northern Flying Squirrel	Canada Goose
Group Breakdown Amphibians: 7 Birds: 179 Mammals: 74 Reptiles: 5	Northern Harrier	Brewer's Sparrow	Olive-backed Pocket Mouse	Wood Duck
	Sharp-shinned Hawk	Field Sparrow	White-footed Mouse	Green-winged Teal
	Cooper's Hawk	Baltimore Oriole	Sagebrush Vole	Mallard
	Northern Goshawk	Bullock's Oriole	American Marten	Northern Pintail
	Swainson's Hawk	Black Rosy-finch	Fisher	Blue-winged Teal
	Ferruginous Hawk	Gray-crowned Rosy-finch	Least Weasel	Cinnamon Teal
	Golden Eagle	White-winged Crossbill	Wolverine	Northern Shoveler
TIER I: 9	Merlin	Vagrant Shrew	American Badger	Gadwall
Boreal Toad	Prairie Falcon	Merriam's Shrew	Western Spotted Skunk	Lesser Scaup
Northern Leopard Frog	Blue Grouse	Pygmy Shrew	Northern River Otter	Common Goldeneye
Trumpeter Swan	Greater Sandhill Crane	Hayden's Shrew	Sagebrush Lizard	Barrow's Goldeneye
Bald Eagle	Franklin's Gull	Yuma Myotis	Rubber Boa	Bufflehead
Long-billed Curlew	Barred Owl	Long-eared Myotis	Western Rattlesnake	Common Merganser
Black-backed Woodpecker	Great Gray Owl	Fringed Myotis	TIER III: 166	Red-breasted Merganser
Gray Wolf	Boreal Owl	Long-legged Myotis		Ruddy Duck
Grizzly Bear	Northern Saw-whet Owl	California Myotis	Boreal Chorus Frog	Osprey
Lynx	Three-toed Woodpecker	Western Small-footed Myotis	Pied-billed Grebe	Red-tailed Hawk
TIER II: 74	Alder Flycatcher	Northern Myotis	Eared Grebe	Rough-legged Hawk
	Hammond's Flycatcher	Silver-haired Bat	Clark's Grebe	American Kestrel
	White-breasted Nuthatch	Big Brown Bat	American White Pelican	Ruffed Grouse
Long-toed Salamander	Brown Creeper	Hoary Bat	Double-crested Cormorant	Sora
Tiger Salamander	Canyon Wren	Mountain Cottontail	Great Blue Heron	American Coot
Tailed Frog	Winter Wren	White-tailed Jackrabbit	Cattle Egret	Lesser Sandhill Crane
Columbia Spotted Frog	Western Bluebird	Uinta Chipmunk	Tundra Swan	Killdeer
Horned Grebe	Veery	Uinta Ground Squirrel	Snow Goose	American Avocet
Western Grebe	Loggerhead Shrike	Wyoming Ground Squirrel	Ross' Goose	Spotted Sandpiper

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Common Snipe	Common Raven	Western Tanager	Little Brown Myotis	Wapiti Or Elk
Wilson's Phalarope	Black-capped Chickadee	Black-headed Grosbeak	American Pika	Mule Deer
Ring-billed Gull	Red-breasted Nuthatch	Lazuli Bunting	Snowshoe Hare	White-tailed Deer
California Gull	Rock Wren	Spotted Towhee	Least Chipmunk	Moose
Mourning Dove	House Wren	American Tree Sparrow	Yellow-pine Chipmunk	Mountain Goat
Great Horned Owl	Marsh Wren	Chipping Sparrow	Yellow-bellied Marmot	Bighorn Sheep
White-throated Swift	American Dipper	Vesper Sparrow	Richardson's Ground Squirrel	Racer
Rufous Hummingbird	Golden-crowned Kinglet	Savannah Sparrow	Golden-mantled Ground Squirrel	Western Terrestrial Garter Snake
Belted Kingfisher	Ruby-crowned Kinglet	Fox Sparrow	Red Squirrel	
Downy Woodpecker	Mountain Bluebird	Song Sparrow	Northern Pocket Gopher	TIER IV: 15
Hairy Woodpecker	Townsend's Solitaire	Lincoln's Sparrow	American Beaver	Little Blue Heron
Northern Flicker	Swainson's Thrush	White-crowned Sparrow	Deer Mouse	Wood Stork
Western Wood-pewee	Hermit Thrush	Harris' Sparrow	Bushy-tailed Woodrat	Mute Swan
Dusky Flycatcher	American Robin	Dark-eyed Junco	Southern Red-backed Vole	Surf Scoter
Cordilleran Flycatcher	Varied Thrush	Bobolink	Heather Vole	Broad-winged Hawk
Western Kingbird	Gray Catbird	Red-winged Blackbird	Meadow Vole	Gray Partridge
Eastern Kingbird	Brown Thrasher	Western Meadowlark	Montane Vole	Chukar
Horned Lark	American Pipit	Yellow-headed Blackbird	Long-tailed Vole	Ring-necked Pheasant
Tree Swallow	Bohemian Waxwing	Brewer's Blackbird	Muskrat	Stilt Sandpiper
Violet-green Swallow	Cedar Waxwing	Common Grackle	Western Jumping Mouse	Bonaparte's Gull
Northern Rough-winged Swallow	Northern Shrike	Brown-headed Cowbird	Common Porcupine	Rock Dove
Bank Swallow	Red-eyed Vireo	Pine Grosbeak	Coyote	European Starling
Cliff Swallow	Yellow Warbler	Cassin's Finch	Red Fox	House Sparrow
Barn Swallow	Yellow-rumped Warbler	House Finch	Black Bear	House Mouse
Gray Jay	Townsend's Warbler	Common Redpoll	Ermine	Common Raccoon
Steller's Jay	Ovenbird	American Goldfinch	Long-tailed Weasel	
Blue Jay	Northern Waterthrush	Evening Grosbeak	Mink	
Clark's Nutcracker	Macgillivray's Warbler	Masked Shrew	Striped Skunk	
Black-billed Magpie	Common Yellowthroat	Dusky Or Montane Shrew	Bobcat	
American Crow	Wilson's Warbler	Water Shrew	Mountain Lion	

14488 **Table 20. Big Hole River Focus Area-Species Associations**
14489

TOTAL: 19	TIER IV: 5
Group Breakdown Fish: 16 Crayfish: 2 Mussels: 1	Rainbow Trout Golden Trout Brown Trout Brook Trout Common Carp
TIER I: 5	
Westslope Cutthroat Trout Lake Trout (Native Lakes) Arctic Grayling Burbot Western Pearlshell	
TIER III: 9	
Mottled Sculpin Mountain Whitefish Longnose Dace Redside Shiner Longnose Sucker White Sucker Mountain Sucker Virile Crayfish A Crayfish (Gambelii)	

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14494 **Table 21. Bitterroot River Focus Area-Species Associations**
14495

TOTAL: 21	TIER IV: 7
Group Breakdown Fish: 19 Crayfish: 1 Mussels: 1	Rainbow Trout Golden Trout Brown Trout Brook Trout Northern Pike Pumpkinseed
TIER I: 3	Largemouth Bass
Westslope Cutthroat Trout Bull Trout Western Pearlshell	
TIER III: 11	
Mottled Sculpin Slimy Sculpin Mountain Whitefish Peamouth Northern Pike Minnow Longnose Dace Redside Shiner Longnose Sucker White Sucker Largescale Sucker Signal Crayfish	

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14500 **Table 22. Blackfoot River Focus Area-Species Associations**
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TOTAL: 23	TIER IV: 8
Group Breakdown Fish: 21 Crayfish: 1 Mussels: 1	Kokanee Salmon Rainbow Trout Brown Trout Brook Trout Northern Pike Pumpkinseed
TIER I: 3	Largemouth Bass
Westslope Cutthroat Trout Bull Trout Western Pearlshell	Yellow Perch
TIER III: 12	
Mottled Sculpin Slimy Sculpin Mountain Whitefish Peamouth Fathead Minnow Northern Pike Minnow Longnose Dace Redside Shiner Longnose Sucker White Sucker Largescale Sucker Signal Crayfish	

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14504 **Table 23. Jefferson River Focus Area-Species Associations**
14505

TOTAL: 20	TIER IV: 7
Group Breakdown Fish: 17 Crayfish: 2 Mussels: 1	Kokanee Salmon Rainbow Trout Brown Trout Brook Trout Lake Trout Common Carp
TIER I: 3	Bluegill
Westslope Cutthroat Trout Burbot Western Pearlshell	
TIER III: 10	
Mottled Sculpin Mountain Whitefish Longnose Dace Redside Shiner Flathead Chub Longnose Sucker White Sucker Mountain Sucker Virile Crayfish A Crayfish (Gambelii)	

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14510 **Table 24. Upper Yellowstone River Focus Area-Species Associations**
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TOTAL: 46	Flathead Chub	Largemouth Bass
Group Breakdown Fish: 45 Crayfish: 1	River Carpsucker Longnose Sucker White Sucker Mountain Sucker Smallmouth Buffalo	White Crappie Black Crappie Yellow Perch Walleye
TIER I: 3	Shorthead Redhorse	
Yellowstone Cutthroat Trout Burbot Sauger	Channel Catfish Brook Stickleback Stonecat Virile Crayfish	
	TIER IV: 19	
TIER II: 2	Rainbow Trout	
Bigmouth Buffalo Freshwater Drum	Golden Trout Brown Trout Brook Trout	
TIER III: 20	Lake Trout	
Mottled Sculpin Goldeye Mountain Whitefish Lake Chub Western Silvery Minnow Emerald Shiner Sand Shiner Fathead Minnow Longnose Dace	Northern Pike Common Carp Black Bullhead Yellow Bullhead Plains Killifish Green Sunfish Pumpkinseed Bluegill Smallmouth Bass	

14513 **Table 25. Mission/Swan Valley and Mountains Focus Area-Species Associations**

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TOTAL: 246	Pacific Treefrog	Pileated Woodpecker	White-tailed Jackrabbit	Spruce Grouse
Group Breakdown Amphibians: 8 Birds: 170 Mammals: 63 Reptiles: 5	Columbia Spotted Frog	Hammond's Flycatcher	Northern Flying Squirrel	Ruffed Grouse
	Horned Grebe	Boreal Chickadee	Water Vole	Sora
	Red-necked Grebe	Chestnut-backed Chickadee	American Marten	Spotted Sandpiper
	Hooded Merganser	White-breasted Nuthatch	Fisher	Common Snipe
	Turkey Vulture	Pygmy Nuthatch	Wolverine	Western Screech-owl
	Sharp-shinned Hawk	Brown Creeper	American Badger	Great Horned Owl
TIER I: 14	Cooper's Hawk	Canyon Wren	Northern River Otter	Common Nighthawk
	Northern Goshawk	Winter Wren	Northern Alligator Lizard	Common Poorwill
Boreal Toad	Swainson's Hawk	Western Bluebird	Rubber Boa	White-throated Swift
Common Loon	Golden Eagle	Veery	Common Garter Snake	Calliope Hummingbird
Trumpeter Swan	Merlin	American Redstart	TIER III: 147	Rufous Hummingbird
Harlequin Duck	Peregrine Falcon	Clay-colored Sparrow		Belted Kingfisher
Bald Eagle	Prairie Falcon	Brewer's Sparrow	Pied-billed Grebe	Red-naped Sapsucker
Flammulated Owl	Blue Grouse	Gray-crowned Rosy-finch	Great Blue Heron	Downy Woodpecker
Black-backed Woodpecker	White-tailed Ptarmigan	White-winged Crossbill	Tundra Swan	Hairy Woodpecker
Olive-sided Flycatcher	Franklin's Gull	Preble's Shrew	Wood Duck	Northern Flicker
Townsend's Big-eared Bat	Northern Pygmy-owl	Vagrant Shrew	Mallard	Western Wood-pewee
Hoary Marmot	Barred Owl	Pygmy Shrew	Common Goldeneye	Willow Flycatcher
Northern Bog Lemming	Great Gray Owl	Long-eared Myotis	Barrow's Goldeneye	Dusky Flycatcher
Gray Wolf	Boreal Owl	Fringed Myotis	Bufflehead	Cordilleran Flycatcher
Grizzly Bear	Northern Saw-whet Owl	Long-legged Myotis	Common Merganser	Tree Swallow
Lynx	Black Swift	California Myotis	Ruddy Duck	Violet-green Swallow
TIER II: 67	Vaux's Swift	Western Small-footed Myotis	Osprey	Northern Rough-winged Swallow
	Black-chinned Hummingbird	Silver-haired Bat	Red-tailed Hawk	Bank Swallow
Long-toed Salamander	Williamson's Sapsucker	Big Brown Bat	Rough-legged Hawk	Cliff Swallow
Tailed Frog	Three-toed Woodpecker	Hoary Bat	Gyr Falcon	Barn Swallow

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Gray Jay	Orange-crowned Warbler	Cassin's Finch	Coyote	Magnolia Warbler
Steller's Jay	Nashville Warbler	Red Crossbill	Red Fox	Connecticut Warbler
Blue Jay	Yellow Warbler	Common Redpoll	Black Bear	Mourning Warbler
Clark's Nutcracker	Yellow-rumped Warbler	Hoary Redpoll	Ermine	Scarlet Tanager
American Crow	Townsend's Warbler	Pine Siskin	Mink	Rose-breasted Grosbeak
Common Raven	Northern Waterthrush	American Goldfinch	Striped Skunk	Norway Rat
Black-capped Chickadee	Macgillivray's Warbler	Evening Grosbeak	Bobcat	
Mountain Chickadee	Common Yellowthroat	Masked Shrew	Mountain Lion	
Red-breasted Nuthatch	Wilson's Warbler	Dusky Or Montane Shrew	Wapiti Or Elk	
Rock Wren	Western Tanager	Water Shrew	Mule Deer	
House Wren	Black-headed Grosbeak	Little Brown Myotis	White-tailed Deer	
Marsh Wren	Lazuli Bunting	American Pika	Moose	
American Dipper	Spotted Towhee	Snowshoe Hare	Mountain Goat	
Golden-crowned Kinglet	American Tree Sparrow	Yellow-pine Chipmunk	Bighorn Sheep	
Ruby-crowned Kinglet	Chipping Sparrow	Red-tailed Chipmunk	Painted Turtle	
Mountain Bluebird	Vesper Sparrow	Yellow-bellied Marmot	Western Terrestrial Garter Snake	
Townsend's Solitaire	Savannah Sparrow	Columbian Ground Squirrel		
Swainson's Thrush	Fox Sparrow	Golden-mantled Ground Squirrel	TIER IV: 18	
Hermit Thrush	Song Sparrow	Red Squirrel	Roughskin Newt	
American Robin	Lincoln's Sparrow	Northern Pocket Gopher	Idaho Giant Salamander	
Varied Thrush	White-crowned Sparrow	American Beaver	Bullfrog	
Gray Catbird	Dark-eyed Junco	Deer Mouse	Red-throated Loon	
American Pipit	Snow Bunting	Bushy-tailed Woodrat	Green Heron	
Bohemian Waxwing	Bobolink	Southern Red-backed Vole	Broad-winged Hawk	
Cedar Waxwing	Red-winged Blackbird	Heather Vole	Wild Turkey	
Northern Shrike	Yellow-headed Blackbird	Meadow Vole	American Woodcock	
Warbling Vireo	Brewer's Blackbird	Montane Vole	Rock Dove	
Red-eyed Vireo	Brown-headed Cowbird	Long-tailed Vole	Yellow-bellied Sapsucker	
Cassin's Vireo	Pine Grosbeak	Muskrat	Scissor-tailed Flycatcher	
Tennessee Warbler	Purple Finch	Common Porcupine	Chestnut-sided Warbler	

14517 **Table 26. Lower Clark Fork River Focus Area-Species Associations**
14518

TOTAL: 30	TIER IV: 13
Group Breakdown Fish Crayfish Mussels	Kokanee Salmon Rainbow Trout Golden Trout Brown Trout Brook Trout Lake Trout
TIER I: 3	Northern Pike
Westslope Cutthroat Trout Bull Trout Western Pearlshell	Black Bullhead Yellow Bullhead Pumpkinseed Smallmouth Bass Largemouth Bass Yellow Perch Lake Whitefish
TIER III: 10	
Mottled Sculpin Slimy Sculpin Mountain Whitefish Peamouth Northern Pike Minnow Longnose Dace Redside Shiner Longnose Sucker Largescale Sucker Signal Crayfish	

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14521 **Table 27. Middle Clark Fork River Focus Area-Species Associations**
14522

TOTAL: 22	TIER IV: 7
Group Breakdown Fish: 20 Crayfish: 1 Mussels: 1	Rainbow Trout Brown Trout Brook Trout Northern Pike Pumpkinseed Largemouth Bass
TIER I: 3	Yellow Perch
Westslope Cutthroat Trout Bull Trout Western Pearlshell	
TIER III: 10	
Mottled Sculpin Slimy Sculpin Mountain Whitefish Northern Pike Minnow Longnose Dace Redside Shiner Longnose Sucker White Sucker Largescale Sucker Signal Crayfish	

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14527 **Table 28. Missouri Coteau Focus Area-Species Associations**

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TOTAL: 325	Milk Snake	Swainson's Hawk	Baird's Sparrow	Least Weasel
Group Breakdown Amphibians: 6 Birds: 239 Mammals: 66 Reptiles: 13	Smooth Green Snake	Ferruginous Hawk	Grasshopper Sparrow	American Badger
		Golden Eagle	Mccown's Longspur	Northern River Otter
		Merlin	Baltimore Oriole	Short-horned Lizard
		Peregrine Falcon	Bullock's Oriole	Rubber Boa
		Prairie Falcon	Preble's Shrew	Common Garter Snake
		Upland Sandpiper	Vagrant Shrew	Western Rattlesnake
		Marbled Godwit	Arctic Shrew	
TIER I: 20		Franklin's Gull	Merriam's Shrew	TIER III: 187
Northern Leopard Frog	TIER II: 78	Caspian Tern	Hayden's Shrew	Boreal Chorus Frog
Common Loon	Tiger Salamander	Common Tern	Yuma Myotis	Pied-billed Grebe
Trumpeter Swan	Great Plains Toad	Forster's Tern	Long-eared Myotis	Eared Grebe
Bald Eagle	Woodhouse's Toad	Black-billed Cuckoo	Long-legged Myotis	Clark's Grebe
Yellow Rail	Plains Spadefoot	Red-headed Woodpecker	Western Small-footed Myotis	American White Pelican
Whooping Crane	Horned Grebe	Alder Flycatcher	Northern Myotis	Double-crested Cormorant
Piping Plover	Western Grebe	Cassin's Kingbird	Silver-haired Bat	Great Blue Heron
Long-billed Curlew	American Bittern	White-breasted Nuthatch	Big Brown Bat	Snowy Egret
Least Tern	Black-crowned Night-heron	Eastern Bluebird	Eastern Red Bat	Tundra Swan
Black Tern	White-faced Ibis	Veery	Hoary Bat	Greater White-fronted Goose
Burrowing Owl	Canvasback	Sprague's Pipit	Eastern Cottontail	Snow Goose
Sedge Wren	Redhead	Loggerhead Shrike	Mountain Cottontail	Ross' Goose
Nelson's Sharp-tailed Sparrow	Hooded Merganser	American Redstart	White-tailed Jackrabbit	Canada Goose
Townsend's Big-eared Bat	Turkey Vulture	Yellow-breasted Chat	Olive-backed Pocket Mouse	Wood Duck
Meadow Jumping Mouse	Northern Harrier	Clay-colored Sparrow	Ord's Kangaroo Rat	Green-winged Teal
Snapping Turtle	Sharp-shinned Hawk	Brewer's Sparrow	White-footed Mouse	American Black Duck
Spiny Softshell	Cooper's Hawk	Field Sparrow	Sagebrush Vole	Mallard
Western Hognose Snake	Northern Goshawk	Lark Bunting	Swift Fox	Northern Pintail

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Blue-winged Teal	Spotted Sandpiper	Eastern Kingbird	Yellow-rumped Warbler	Brewer's Blackbird
Cinnamon Teal	Semipalmated Sandpiper	Horned Lark	Ovenbird	Common Grackle
Northern Shoveler	Western Sandpiper	Tree Swallow	Northern Waterthrush	Brown-headed Cowbird
Gadwall	Least Sandpiper	Violet-green Swallow	Macgillivray's Warbler	Purple Finch
American Wigeon	White-rumped Sandpiper	Northern Rough-winged Swallow	Common Yellowthroat	Cassin's Finch
Ring-necked Duck	Baird's Sandpiper	Bank Swallow	Wilson's Warbler	House Finch
Greater Scaup	Pectoral Sandpiper	Cliff Swallow	Western Tanager	Red Crossbill
Lesser Scaup	Dunlin	Barn Swallow	Black-headed Grosbeak	Common Redpoll
Long Tailed Duck	Long-billed Dowitcher	Blue Jay	Lazuli Bunting	Pine Siskin
White-winged Scoter	Common Snipe	Black-billed Magpie	Dickcissel	American Goldfinch
Common Goldeneye	Wilson's Phalarope	American Crow	Spotted Towhee	Evening Grosbeak
Bufflehead	Ring-billed Gull	Black-capped Chickadee	American Tree Sparrow	Masked Shrew
Common Merganser	California Gull	Red-breasted Nuthatch	Chipping Sparrow	Dusky Or Montane Shrew
Red-breasted Merganser	Herring Gull	Rock Wren	Vesper Sparrow	Little Brown Myotis
Ruddy Duck	Glaucous Gull	House Wren	Lark Sparrow	Desert Cottontail
Osprey	Mourning Dove	Marsh Wren	Savannah Sparrow	Yellow-bellied Marmot
Red-tailed Hawk	Eastern Screech-owl	Ruby-crowned Kinglet	Song Sparrow	Richardson's Ground Squirrel
Rough-legged Hawk	Great Horned Owl	Mountain Bluebird	Lincoln's Sparrow	Thirteen-lined Ground Squirrel
American Kestrel	Snowy Owl	Townsend's Solitaire	Swamp Sparrow	Eastern Fox Squirrel
Virginia Rail	Short-eared Owl	Swainson's Thrush	White-throated Sparrow	Northern Pocket Gopher
Sora	Common Nighthawk	American Robin	White-crowned Sparrow	American Beaver
American Coot	Belted Kingfisher	Gray Catbird	Harris' Sparrow	Western Harvest Mouse
Lesser Sandhill Crane	Downy Woodpecker	Brown Thrasher	Dark-eyed Junco	Deer Mouse
Killdeer	Hairy Woodpecker	American Pipit	Lapland Longspur	Northern Grasshopper Mouse
Black-necked Stilt	Northern Flicker	Bohemian Waxwing	Chestnut-collared Longspur	Bushy-tailed Woodrat
American Avocet	Western Wood-pewee	Cedar Waxwing	Bobolink	Southern Red-backed Vole
Greater Yellowlegs	Willow Flycatcher	Northern Shrike	Red-winged Blackbird	Meadow Vole
Lesser Yellowlegs	Least Flycatcher	Red-eyed Vireo	Western Meadowlark	Montane Vole
Solitary Sandpiper	Say's Phoebe	Orange-crowned Warbler	Yellow-headed Blackbird	Long-tailed Vole
Willet	Western Kingbird	Yellow Warbler	Rusty Blackbird	Prairie Vole

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Muskrat	Semipalmated Plover
Western Jumping Mouse	Whimbrel
Common Porcupine	Hudsonian Godwit
Coyote	Ruddy Turnstone
Red Fox	Red Knot
Black Bear	Sanderling
Long-tailed Weasel	Stilt Sandpiper
Mink	Short-billed Dowitcher
Striped Skunk	Red-necked Phalarope
Bobcat	Bonaparte's Gull
Wapiti Or Elk	Rock Dove
Mule Deer	Band-tailed Pigeon
White-tailed Deer	Ruby-throated Hummingbird
Moose	Gray-cheeked Thrush
Pronghorn	European Starling
Painted Turtle	Magnolia Warbler
Racer	Cape May Warbler
Gopher Snake	Palm Warbler
Plains Garter Snake	Blackpoll Warbler
	Mourning Warbler
TIER IV: 34	Canada Warbler
Red-throated Loon	Rose-breasted Grosbeak
Pacific Loon	House Sparrow
Least Bittern	House Mouse
Eurasian Wigeon	Common Raccoon
Gray Partridge	
Ring-necked Pheasant	
Wild Turkey	
Black-bellied Plover	
American Golden-plover	

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14534**Table 29. Montana Sedimentary Plains Focus Area-Species Associations**

TOTAL: 347	Snapping Turtle	Peregrine Falcon	Indigo Bunting	White-footed Mouse
Group Breakdown Amphibians: 7 Birds: 259 Mammals: 68 Reptiles: 13	Spiny Softshell	Prairie Falcon	Clay-colored Sparrow	Sagebrush Vole
	Western Hognose Snake	Blue Grouse	Brewer's Sparrow	Swift Fox
	Milk Snake	Greater Sandhill Crane	Field Sparrow	Least Weasel
		Upland Sandpiper	Lark Bunting	American Badger
	TIER II: 85	Marbled Godwit	Baird's Sparrow	Northern River Otter
TIER I: 22	Tiger Salamander	Franklin's Gull	Grasshopper Sparrow	Short-horned Lizard
	Great Plains Toad	Caspian Tern	Mccown's Longspur	Sagebrush Lizard
	Woodhouse's Toad	Common Tern	Baltimore Oriole	Common Garter Snake
	Plains Spadefoot	Forster's Tern	Bullock's Oriole	Western Rattlesnake
Northern Leopard Frog	Horned Grebe	Black-billed Cuckoo	Preble's Shrew	TIER III: 206
Common Loon	Western Grebe	Northern Hawk Owl	Dwarf Shrew	
Trumpeter Swan	American Bittern	Northern Pygmy-owl	Merriam's Shrew	Boreal Chorus Frog
Bald Eagle	Black-crowned Night-heron	Northern Saw-whet Owl	Hayden's Shrew	Pied-billed Grebe
Sage-grouse	White-faced Ibis	Red-headed Woodpecker	Yuma Myotis	Eared Grebe
Whooping Crane	Canvasback	Cassin's Kingbird	Long-eared Myotis	Clark's Grebe
Mountain Plover	Redhead	Pinyon Jay	Long-legged Myotis	American White Pelican
Long-billed Curlew	Hooded Merganser	White-breasted Nuthatch	Western Small-footed Myotis	Double-crested Cormorant
Least Tern	Turkey Vulture	Pygmy Nuthatch	Silver-haired Bat	Great Blue Heron
Black Tern	Northern Harrier	Canyon Wren	Big Brown Bat	Snowy Egret
Burrowing Owl	Sharp-shinned Hawk	Eastern Bluebird	Eastern Red Bat	Cattle Egret
Spotted Bat	Cooper's Hawk	Veery	Hoary Bat	Tundra Swan
Townsend's Big-eared Bat	Northern Goshawk	Sprague's Pipit	Eastern Cottontail	Greater White-fronted Goose
Black-tailed Prairie Dog	Swainson's Hawk	Loggerhead Shrike	Mountain Cottontail	Snow Goose
Meadow Jumping Mouse	Ferruginous Hawk	Black-and-white Warbler	White-tailed Jackrabbit	Ross' Goose
Black-footed Ferret	Golden Eagle	American Redstart	Ord's Kangaroo Rat	Canada Goose
Lynx	Merlin	Yellow-breasted Chat	Hispid Pocket Mouse	Wood Duck
American Bison				

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Green-winged Teal	Killdeer	White-throated Swift	Ruby-crowned Kinglet	Chipping Sparrow
American Black Duck	Black-necked Stilt	Belted Kingfisher	Mountain Bluebird	Vesper Sparrow
Mallard	American Avocet	Red-naped Sapsucker	Townsend's Solitaire	Lark Sparrow
Northern Pintail	Greater Yellowlegs	Downy Woodpecker	Swainson's Thrush	Savannah Sparrow
Blue-winged Teal	Lesser Yellowlegs	Hairy Woodpecker	American Robin	Song Sparrow
Cinnamon Teal	Solitary Sandpiper	Northern Flicker	Gray Catbird	Lincoln's Sparrow
Northern Shoveler	Willet	Western Wood-pewee	Northern Mockingbird	Swamp Sparrow
Gadwall	Spotted Sandpiper	Willow Flycatcher	Sage Thrasher	White-throated Sparrow
American Wigeon	Semipalmated Sandpiper	Least Flycatcher	Brown Thrasher	White-crowned Sparrow
Ring-necked Duck	Western Sandpiper	Dusky Flycatcher	American Pipit	Harris' Sparrow
Lesser Scaup	Least Sandpiper	Say's Phoebe	Bohemian Waxwing	Dark-eyed Junco
Long Tailed Duck	White-rumped Sandpiper	Western Kingbird	Cedar Waxwing	Lapland Longspur
White-winged Scoter	Baird's Sandpiper	Eastern Kingbird	Northern Shrike	Chestnut-collared Longspur
Common Goldeneye	Pectoral Sandpiper	Horned Lark	Warbling Vireo	Bobolink
Barrow's Goldeneye	Dunlin	Tree Swallow	Red-eyed Vireo	Red-winged Blackbird
Bufflehead	Long-billed Dowitcher	Violet-green Swallow	Orange-crowned Warbler	Western Meadowlark
Common Merganser	Common Snipe	Northern Rough-winged Swallow	Nashville Warbler	Yellow-headed Blackbird
Red-breasted Merganser	Wilson's Phalarope	Bank Swallow	Yellow Warbler	Rusty Blackbird
Ruddy Duck	Ring-billed Gull	Cliff Swallow	Yellow-rumped Warbler	Brewer's Blackbird
Osprey	California Gull	Barn Swallow	Ovenbird	Common Grackle
Red-tailed Hawk	Herring Gull	Blue Jay	Northern Waterthrush	Brown-headed Cowbird
Rough-legged Hawk	Mourning Dove	Clark's Nutcracker	Macgillivray's Warbler	Orchard Oriole
American Kestrel	Eastern Screech-owl	Black-billed Magpie	Common Yellowthroat	Purple Finch
Gyr Falcon	Great Horned Owl	American Crow	Wilson's Warbler	Cassin's Finch
Ruffed Grouse	Snowy Owl	Black-capped Chickadee	Western Tanager	House Finch
Sharp-tailed Grouse	Long-eared Owl	Mountain Chickadee	Black-headed Grosbeak	Red Crossbill
Virginia Rail	Short-eared Owl	Red-breasted Nuthatch	Lazuli Bunting	Common Redpoll
Sora	Common Nighthawk	Rock Wren	Dickcissel	Pine Siskin
American Coot	Common Poorwill	House Wren	Spotted Towhee	American Goldfinch
Lesser Sandhill Crane	Chimney Swift	Marsh Wren	American Tree Sparrow	Evening Grosbeak

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Masked Shrew	Bobcat	Sanderling
Dusky Or Montane Shrew	Wapiti Or Elk	Stilt Sandpiper
Water Shrew	Mule Deer	Buff-breasted Sandpiper
Little Brown Myotis	White-tailed Deer	Short-billed Dowitcher
Desert Cottontail	Moose	Red-necked Phalarope
Least Chipmunk	Pronghorn	Red Phalarope
Yellow-pine Chipmunk	Painted Turtle	Bonaparte's Gull
Yellow-bellied Marmot	Racer	Rock Dove
Richardson's Ground Squirrel	Gopher Snake	Scissor-tailed Flycatcher
Thirteen-lined Ground Squirrel	Western Terrestrial Garter Snake	Gray-cheeked Thrush
Eastern Fox Squirrel	Plains Garter Snake	European Starling
Red Squirrel		Magnolia Warbler
Northern Pocket Gopher	TIER IV: 34	Blackpoll Warbler
American Beaver	Bullfrog	Rose-breasted Grosbeak
Western Harvest Mouse	Great Egret	House Sparrow
Deer Mouse	Little Blue Heron	House Mouse
Northern Grasshopper Mouse	Green Heron	Common Raccoon
Bushy-tailed Woodrat	Wood Stork	
Meadow Vole	Brant	
Long-tailed Vole	Surf Scoter	
Prairie Vole	Broad-winged Hawk	
Muskrat	Gray Partridge	
Western Jumping Mouse	Ring-necked Pheasant	
Common Porcupine	Wild Turkey	
Coyote	Black-bellied Plover	
Red Fox	American Golden-plover	
Black Bear	Semipalmated Plover	
Long-tailed Weasel	Whimbrel	
Mink	Hudsonian Godwit	
Striped Skunk	Red Knot	

14538 **Table 30. Lower Missouri River Focus Area-Species Associations**
14539

TOTAL: 55	Lake Whitefish	TIER IV: 15
Group Breakdown Fish: 50 Crayfish: 2 Mussels: 3	Mountain Whitefish Lake Chub Brassy Minnow Plains Minnow Emerald Shiner Sand Shiner	Cisco Chinook Salmon Rainbow Trout Brown Trout Lake Trout Rainbow Smelt
TIER I: 9	Northern Redbelly Dace	Northern Pike
Pallid Sturgeon Paddlefish Shortnose Gar Sturgeon Chub Sicklefin Chub Pearl Dace Blue Sucker Burbot Sauger	Fathead Minnow Longnose Dace Creek Chub Flathead Chub River Carpsucker Longnose Sucker White Sucker Smallmouth Buffalo Shorthead Redhorse Channel Catfish	Common Carp Spottail Shiner Black Bullhead Smallmouth Bass Largemouth Bass White Crappie Yellow Perch Walleye
TIER II: 4	Stonecat	
Northern Redbelly X Finescale Dace Bigmouth Buffalo Freshwater Drum Black Sandshell	Brook Stickleback Iowa Darter Calico Crayfish Virile Crayfish Fatmucket	
TIER: 27	Giant Floater	
Shovelnose Sturgeon Goldeye		

14541 **Table 31. Lower Yellowstone River Focus Area-Species Associations**

14542

TOTAL: 65	Goldeye	TIER IV: 24
Group Breakdown Fish: 60 Crayfish: 1 Mussels: 3	Mountain Whitefish Lake Chub Western Silvery Minnow Brassy Minnow Plains Minnow Emerald Shiner Sand Shiner	Cisco Rainbow Trout Brown Trout Brook Trout Rainbow Smelt Northern Pike Common Carp
TIER I: 9	Northern Redbelly Dace Fathead Minnow Longnose Dace Creek Chub Flathead Chub River Carpsucker Longnose Sucker White Sucker Mountain Sucker Smallmouth Buffalo Shorthead Redhorse	Golden Shiner Spottail Shiner Black Bullhead Yellow Bullhead Rock Bass Plains Killifish Sailfin Molly White Bass Green Sunfish Pumpkinseed Bluegill
TIER II: 4	Channel Catfish	Smallmouth Bass
Northern Redbelly X Finescale Dace Bigmouth Buffalo Freshwater Drum Black Sandshell	Stonecat Brook Stickleback Iowa Darter Virile Crayfish Fatmucket Giant Floater	Largemouth Bass White Crappie Black Crappie Yellow Perch Walleye
TIER III: 27		
Shovelnose Sturgeon		

14543

14544 **Table 32. Powder River Focus Area-Species Associations**
14545

TOTAL: 38	Smallmouth Buffalo
Group Breakdown Fish: 36 Crayfish: 1 Mussels: 1	Shorthead Redhorse Channel Catfish Stonecat Brook Stickleback Iowa Darter Virile Crayfish
TIER I: 3	Fatmucket
Sturgeon Chub Burbot Sauger	TIER IV: 13 Rainbow Trout Brown Trout Brook Trout
TIER III: 22	Northern Pike Common Carp Black Bullhead Yellow Bullhead Plains Killifish Green Sunfish Bluegill Largemouth Bass White Crappie Walleye
Shovelnose Sturgeon Goldeye Lake Chub Western Silvery Minnow Brassy Minnow Plains Minnow Sand Shiner Fathead Minnow Longnose Dace Creek Chub Flathead Chub River Carpsucker Longnose Sucker White Sucker	

14547 **Table 33. Tongue River Focus Area-Species Associations**
14548

TOTAL: 49	Sand Shiner	Rock Bass
Group Breakdown Fish: 47 Crayfish: 1 Mussels: 1	Fathead Minnow Longnose Dace Creek Chub Flathead Chub River Carpsucker Longnose Sucker	Green Sunfish Pumpkinseed Bluegill Smallmouth Bass Largemouth Bass White Crappie Black Crappie
TIER I: 5	White Sucker	Yellow Perch
Paddlefish	Mountain Sucker	Walleye
Sturgeon Chub	Smallmouth Buffalo	
Blue Sucker	Shorthead Redhorse	
Burbot	Channel Catfish	
Sauger	Stonecat	
	Virile Crayfish	
	Fatmucket	
TIER II: 1		
Bigmouth Buffalo	TIER IV: 20	
	Rainbow Trout	
TIER III: 23	Brown Trout	
Shovelnose Sturgeon	Brook Trout	
Mountain Whitefish	Northern Pike	
Goldeye	Common Carp	
Lake Chub	Golden Shiner	
Western Silvery Minnow	Spottail Shiner	
Brassy Minnow	Black Bullhead	
Plains Minnow	Yellow Bullhead	
Emerald Shiner	White Bass	

14550 **Table 34. Bighorn Intermontane Basin Focus Area-Species Associations**

14551

TOTAL: 174	Plains Spadefoot	Olive-backed Pocket Mouse	American Wigeon	Long-eared Owl
Group Breakdown Amphibians: 5 Birds: 117 Mammals: 43 Reptiles: 9	Northern Harrier	Ord's Kangaroo Rat	Canvasback	Short-eared Owl
	Ferruginous Hawk	Sagebrush Vole	Redhead	Common Nighthawk
	Rough-legged Hawk	American Badger	Ring-necked Duck	Calliope Hummingbird
	Golden Eagle	Short-horned Lizard	Lesser Scaup	Belted Kingfisher
	Merlin	Sagebrush Lizard	Long Tailed Duck	Northern Flicker
TIER I: 14	Peregrine Falcon	Western Rattlesnake	Common Goldeneye	Say's Phoebe
	Gyr Falcon		Barrow's Goldeneye	Eastern Kingbird
	Prairie Falcon	TIER III: 112	Bufflehead	Horned Lark
Northern Leopard Frog	Canyon Wren	Boreal Chorus Frog	Common Merganser	Violet-green Swallow
Bald Eagle	Blue-gray Gnatcatcher	Eared Grebe	Ruddy Duck	Bank Swallow
Sage-grouse	Loggerhead Shrike	Western Grebe	Turkey Vulture	Cliff Swallow
Mountain Plover	Black-and-white Warbler	American White Pelican	Red-tailed Hawk	Barn Swallow
Long-billed Curlew	Yellow-breasted Chat	Double-crested Cormorant	American Kestrel	Pinyon Jay
Burrowing Owl	Indigo Bunting	Great Blue Heron	Sharp-tailed Grouse	Black-billed Magpie
Spotted Bat	Green-tailed Towhee	Tundra Swan	American Coot	American Crow
Pallid Bat	Clay-colored Sparrow	Greater White-fronted Goose	American Coot	Common Raven
Black-tailed Prairie Dog	Brewer's Sparrow	Snow Goose	Greater Sandhill Crane	Mountain Chickadee
White-tailed Prairie Dog	Bullock's Oriole	Canada Goose	Killdeer	Rock Wren
Gray Wolf	Preble's Shrew	Green-winged Teal	American Avocet	House Wren
Black-footed Ferret	Dwarf Shrew	American Black Duck	Dunlin	Mountain Bluebird
Western Hognose Snake	Merriam's Shrew	Mallard	Common Snipe	American Robin
Milk Snake	Yuma Myotis	Northern Pintail	Wilson's Phalarope	Gray Catbird
	Long-eared Myotis	Blue-winged Teal	California Gull	Northern Mockingbird
TIER II: 36	Long-legged Myotis	Cinnamon Teal	Mourning Dove	Sage Thrasher
Tiger Salamander	Western Small-footed Myotis	Northern Shoveler	Great Horned Owl	Bohemian Waxwing
Woodhouse's Toad	Mountain Cottontail	Gadwall	Snowy Owl	Cedar Waxwing

14552

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Northern Shrike	Bobcat
Spotted Towhee	Mountain Lion
Vesper Sparrow	Wapiti or Elk
Lark Sparrow	Mule Deer
Savannah Sparrow	White-tailed Deer
Lapland Longspur	Pronghorn
Bobolink	Painted Turtle
Red-winged Blackbird	Racer
Western Meadowlark	Gopher Snake
Yellow-headed Blackbird	Plains Garter Snake
Brewer's Blackbird	
Common Grackle	TIER IV: 12
House Finch	Broad-winged Hawk
Common Redpoll	Chukar
Dusky Or Montane Shrew	Ring-necked Pheasant
Desert Cottontail	Wild Turkey
Least Chipmunk	Rock Dove
Thirteen-lined Ground Squirrel	European Starling
Northern Pocket Gopher	Pine Warbler
American Beaver	Palm Warbler
Western Harvest Mouse	House Sparrow
Deer Mouse	Eastern Fox Squirrel
Northern Grasshopper Mouse	House Mouse
Meadow Vole	Common Raccoon
Muskrat	
Common Porcupine	
Coyote	
Red Fox	
Black Bear	
Striped Skunk	

14554 **Table 35. Montana Glaciated Plains Focus Area-Species Associations**

14555

TOTAL: 368	Lynx	Swainson's Hawk	Black-and-white Warbler	Eastern Red Bat
Group Breakdown Amphibians: 6 Birds: 280 Mammals: 69 Reptiles: 13	American Bison	Ferruginous Hawk	American Redstart	Hoary Bat
	Snapping Turtle	Golden Eagle	Yellow-breasted Chat	Mountain Cottontail
	Spiny Softshell	Merlin	Indigo Bunting	White-tailed Jackrabbit
	Western Hognose Snake	Peregrine Falcon	Green-tailed Towhee	Olive-backed Pocket Mouse
	Milk Snake	Prairie Falcon	Clay-colored Sparrow	Ord's Kangaroo Rat
TIER I: 24	TIER II: 88	Greater Sandhill Crane	Brewer's Sparrow	White-footed Mouse
		Upland Sandpiper	Field Sparrow	Sagebrush Vole
		Marbled Godwit	Lark Bunting	Swift Fox
		Franklin's Gull	Baird's Sparrow	Least Weasel
		Caspian Tern	Grasshopper Sparrow	American Badger
Northern Leopard Frog Common Loon Bald Eagle Sage-grouse Yellow Rail Whooping Crane Piping Plover Mountain Plover Long-billed Curlew Least Tern Black Tern Burrowing Owl Sedge Wren Nelson's Sharp-tailed Sparrow Spotted Bat Townsend's Big-eared Bat Black-tailed Prairie Dog Black-footed Ferret	Woodhouse's Toad	Common Tern	Le Conte's Sparrow	Northern River Otter
	Plains Spadefoot	Forster's Tern	Mccown's Longspur	Short-horned Lizard
	Horned Grebe	Black-billed Cuckoo	Baltimore Oriole	Sagebrush Lizard
	Red-necked Grebe	Barn Owl	Bullock's Oriole	Common Garter Snake
	Western Grebe	Northern Saw-whet Owl	Preble's Shrew	Western Rattlesnake
	American Bittern	Lewis' Woodpecker	Vagrant Shrew	
	Black-crowned Night-heron	Red-headed Woodpecker	Merriam's Shrew	TIER III: 208
	White-faced Ibis	Alder Flycatcher	Hayden's Shrew	Boreal Chorus Frog
	Canvasback	Cassin's Kingbird	Yuma Myotis	Pied-billed Grebe
	Redhead	Pinyon Jay	Long-eared Myotis	Eared Grebe
	Hooded Merganser	White-breasted Nuthatch	Fringed Myotis	Clark's Grebe
	Turkey Vulture	Eastern Bluebird	Long-legged Myotis	American White Pelican
	Northern Harrier	Western Bluebird	Western Small-footed Myotis	Double-crested Cormorant
	Sharp-shinned Hawk	Veery	Northern Myotis	Great Blue Heron
	Cooper's Hawk	Sprague's Pipit	Silver-haired Bat	Snowy Egret
	Northern Goshawk	Loggerhead Shrike	Big Brown Bat	Cattle Egret

14556

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Tundra Swan	Ruffed Grouse	Mourning Dove	Blue Jay	Macgillivray's Warbler
Greater White-fronted Goose	Sharp-tailed Grouse	Eastern Screech-owl	Black-billed Magpie	Common Yellowthroat
Snow Goose	Virginia Rail	Great Horned Owl	American Crow	Wilson's Warbler
Ross' Goose	Sora	Snowy Owl	Black-capped Chickadee	Western Tanager
Canada Goose	American Coot	Long-eared Owl	Mountain Chickadee	Black-headed Grosbeak
Wood Duck	Lesser Sandhill Crane	Short-eared Owl	Red-breasted Nuthatch	Lazuli Bunting
Green-winged Teal	Killdeer	Common Nighthawk	Rock Wren	Dickcissel
American Black Duck	Black-necked Stilt	Common Poorwill	House Wren	Spotted Towhee
Mallard	American Avocet	Chimney Swift	Marsh Wren	American Tree Sparrow
Northern Pintail	Greater Yellowlegs	White-throated Swift	Ruby-crowned Kinglet	Chipping Sparrow
Blue-winged Teal	Lesser Yellowlegs	Belted Kingfisher	Mountain Bluebird	Vesper Sparrow
Cinnamon Teal	Solitary Sandpiper	Red-naped Sapsucker	Townsend's Solitaire	Lark Sparrow
Northern Shoveler	Willet	Downy Woodpecker	Swainson's Thrush	Savannah Sparrow
Gadwall	Spotted Sandpiper	Hairy Woodpecker	Hermit Thrush	Song Sparrow
American Wigeon	Semipalmated Sandpiper	Northern Flicker	American Robin	Lincoln's Sparrow
Ring-necked Duck	Western Sandpiper	Western Wood-pewee	Gray Catbird	Swamp Sparrow
Greater Scaup	Least Sandpiper	Willow Flycatcher	Northern Mockingbird	White-throated Sparrow
Lesser Scaup	White-rumped Sandpiper	Least Flycatcher	Sage Thrasher	White-crowned Sparrow
Long Tailed Duck	Baird's Sandpiper	Dusky Flycatcher	Brown Thrasher	Harris' Sparrow
White-winged Scoter	Pectoral Sandpiper	Cordilleran Flycatcher	American Pipit	Dark-eyed Junco
Common Goldeneye	Dunlin	Say's Phoebe	Bohemian Waxwing	Lapland Longspur
Barrow's Goldeneye	Long-billed Dowitcher	Western Kingbird	Cedar Waxwing	Chestnut-collared Longspur
Bufflehead	Common Snipe	Eastern Kingbird	Northern Shrike	Bobolink
Common Merganser	Wilson's Phalarope	Horned Lark	Warbling Vireo	Red-winged Blackbird
Red-breasted Merganser	Ring-billed Gull	Tree Swallow	Red-eyed Vireo	Western Meadowlark
Ruddy Duck	California Gull	Violet-green Swallow	Orange-crowned Warbler	Yellow-headed Blackbird
Osprey	Herring Gull	Northern Rough-winged Swallow	Yellow Warbler	Rusty Blackbird
Red-tailed Hawk	Glaucous-winged Gull	Bank Swallow	Yellow-rumped Warbler	Brewer's Blackbird
Rough-legged Hawk	Glaucous Gull	Cliff Swallow	Ovenbird	Common Grackle
American Kestrel	Arctic Tern	Barn Swallow	Northern Waterthrush	Brown-headed Cowbird

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Purple Finch	Common Porcupine	Ring-necked Pheasant	Hooded Warbler
Cassin's Finch	Coyote	Wild Turkey	Canada Warbler
House Finch	Red Fox	Black-bellied Plover	Scarlet Tanager
Red Crossbill	Black Bear	American Golden-plover	Rose-breasted Grosbeak
Common Redpoll	Ermine	Semipalmated Plover	Golden-crowned Sparrow
Pine Siskin	Long-tailed Weasel	Whimbrel	House Sparrow
American Goldfinch	Mink	Hudsonian Godwit	House Mouse
Evening Grosbeak	Striped Skunk	Ruddy Turnstone	Common Raccoon
Masked Shrew	Bobcat	Red Knot	
Dusky Or Montane Shrew	Wapiti Or Elk	Sanderling	
Water Shrew	Mule Deer	Curlew Sandpiper	
Little Brown Myotis	White-tailed Deer	Stilt Sandpiper	
Desert Cottontail	Moose	Buff-breasted Sandpiper	
Snowshoe Hare	Pronghorn	Short-billed Dowitcher	
Least Chipmunk	Painted Turtle	Red-necked Phalarope	
Yellow-bellied Marmot	Racer	Red Phalarope	
Richardson's Ground Squirrel	Gopher Snake	Bonaparte's Gull	
Thirteen-lined Ground Squirrel	Western Terrestrial Garter Snake	Mew Gull	
Red Squirrel	Plains Garter Snake	Thayer's Gull	
Northern Pocket Gopher		Rock Dove	
American Beaver	TIER IV: 47	Band-tailed Pigeon	
Western Harvest Mouse	Least Bittern	Ruby-throated Hummingbird	
Deer Mouse	Great Egret	Red-bellied Woodpecker	
Northern Grasshopper Mouse	Green Heron	Eastern Wood-pewee	
Bushy-tailed Woodrat	Yellow-crowned Night-heron	Gray-cheeked Thrush	
Meadow Vole	Eurasian Wigeon	European Starling	
Montane Vole	Black Scoter	Magnolia Warbler	
Long-tailed Vole	Surf Scoter	Cape May Warbler	
Prairie Vole	Broad-winged Hawk	Blackpoll Warbler	
Muskrat	Gray Partridge	Mourning Warbler	

14559 **Table 36. Montana Shale Plains Focus Area-Species Associations**

14560

TOTAL: 307	TIER II: 75			
Group Breakdown Amphibians: 6 Birds: 230 Mammals: 59 Reptiles: 12	Tiger Salamander	Caspian Tern	Hayden's Shrew	American White Pelican
	Great Plains Toad	Common Tern	Yuma Myotis	Double-crested Cormorant
	Woodhouse's Toad	Forster's Tern	Long-eared Myotis	Great Blue Heron
	Plains Spadefoot	Black-billed Cuckoo	Long-legged Myotis	Snowy Egret
	Western Grebe	Northern Saw-whet Owl	Western Small-footed Myotis	Tundra Swan
TIER I: 18	American Bittern	Lewis' Woodpecker	Silver-haired Bat	Greater White-fronted Goose
	Black-crowned Night-heron	Red-headed Woodpecker	Big Brown Bat	Snow Goose
Northern Leopard Frog Common Loon Bald Eagle Sage-grouse Whooping Crane Mountain Plover Long-billed Curlew Black Tern Burrowing Owl Townsend's Big-eared Bat Black-tailed Prairie Dog Meadow Jumping Mouse Black-footed Ferret Lynx American Bison Spiny Softshell Western Hognose Snake Milk Snake	White-faced Ibis	Pinyon Jay	Eastern Red Bat	Ross' Goose
	Canvasback	White-breasted Nuthatch	Hoary Bat	Canada Goose
	Redhead	Pygmy Nuthatch	Mountain Cottontail	Wood Duck
	Hooded Merganser	Veery	White-tailed Jackrabbit	Green-winged Teal
	Turkey Vulture	Sprague's Pipit	Olive-backed Pocket Mouse	Mallard
	Northern Harrier	Loggerhead Shrike	Ord's Kangaroo Rat	Northern Pintail
	Sharp-shinned Hawk	American Redstart	White-footed Mouse	Blue-winged Teal
	Cooper's Hawk	Yellow-breasted Chat	Sagebrush Vole	Cinnamon Teal
	Northern Goshawk	Clay-colored Sparrow	Swift Fox	Northern Shoveler
	Swainson's Hawk	Brewer's Sparrow	American Badger	Gadwall
	Ferruginous Hawk	Field Sparrow	Northern River Otter	American Wigeon
	Golden Eagle	Lark Bunting	Short-horned Lizard	Ring-necked Duck
	Merlin	Baird's Sparrow	Sagebrush Lizard	Lesser Scaup
	Peregrine Falcon	Grasshopper Sparrow	Common Garter Snake	Long Tailed Duck
	Prairie Falcon	Mccown's Longspur	Western Rattlesnake	White-winged Scoter
	Greater Sandhill Crane	Baltimore Oriole		Common Goldeneye
	Upland Sandpiper	Bullock's Oriole	TIER III: 189	Barrow's Goldeneye
	Marbled Godwit	Preble's Shrew	Boreal Chorus Frog	Bufflehead
	Franklin's Gull	Dwarf Shrew	Pied-billed Grebe	Common Merganser
		Merriam's Shrew	Eared Grebe	Red-breasted Merganser

14561

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Ruddy Duck	California Gull	Clark's Nutcracker	Macgillivray's Warbler	Common Redpoll
Osprey	Herring Gull	Black-billed Magpie	Common Yellowthroat	Pine Siskin
Red-tailed Hawk	Mourning Dove	American Crow	Wilson's Warbler	American Goldfinch
Rough-legged Hawk	Eastern Screech-owl	Black-capped Chickadee	Western Tanager	Evening Grosbeak
American Kestrel	Great Horned Owl	Mountain Chickadee	Black-headed Grosbeak	Masked Shrew
Gyr Falcon	Snowy Owl	Red-breasted Nuthatch	Lazuli Bunting	Little Brown Myotis
Ruffed Grouse	Long-eared Owl	Rock Wren	Dickcissel	Desert Cottontail
Sharp-tailed Grouse	Short-eared Owl	House Wren	Spotted Towhee	Least Chipmunk
Virginia Rail	Common Nighthawk	Marsh Wren	American Tree Sparrow	Yellow-bellied Marmot
Sora	Common Poorwill	Ruby-crowned Kinglet	Chipping Sparrow	Richardson's Ground Squirrel
American Coot	White-throated Swift	Mountain Bluebird	Vesper Sparrow	Thirteen-lined Ground Squirrel
Lesser Sandhill Crane	Belted Kingfisher	Townsend's Solitaire	Lark Sparrow	Eastern Fox Squirrel
Killdeer	Downy Woodpecker	Swainson's Thrush	Savannah Sparrow	Red Squirrel
Black-necked Stilt	Hairy Woodpecker	Hermit Thrush	Song Sparrow	Northern Pocket Gopher
American Avocet	Northern Flicker	American Robin	Lincoln's Sparrow	American Beaver
Greater Yellowlegs	Western Wood-pewee	Gray Catbird	White-throated Sparrow	Western Harvest Mouse
Lesser Yellowlegs	Willow Flycatcher	Northern Mockingbird	White-crowned Sparrow	Deer Mouse
Solitary Sandpiper	Least Flycatcher	Sage Thrasher	Harris' Sparrow	Northern Grasshopper Mouse
Willet	Dusky Flycatcher	Brown Thrasher	Dark-eyed Junco	Bushy-tailed Woodrat
Spotted Sandpiper	Say's Phoebe	American Pipit	Lapland Longspur	Meadow Vole
Semipalmated Sandpiper	Western Kingbird	Bohemian Waxwing	Chestnut-collared Longspur	Long-tailed Vole
Western Sandpiper	Eastern Kingbird	Cedar Waxwing	Bobolink	Prairie Vole
Least Sandpiper	Horned Lark	Northern Shrike	Red-winged Blackbird	Muskrat
Baird's Sandpiper	Tree Swallow	Warbling Vireo	Western Meadowlark	Common Porcupine
Pectoral Sandpiper	Violet-green Swallow	Red-eyed Vireo	Yellow-headed Blackbird	Coyote
Dunlin	Northern Rough-winged Swallow	Orange-crowned Warbler	Brewer's Blackbird	Red Fox
Long-billed Dowitcher	Bank Swallow	Yellow Warbler	Common Grackle	Long-tailed Weasel
Common Snipe	Cliff Swallow	Yellow-rumped Warbler	Brown-headed Cowbird	Mink
Wilson's Phalarope	Barn Swallow	Ovenbird	House Finch	Striped Skunk
Ring-billed Gull	Blue Jay	Northern Waterthrush	Red Crossbill	Bobcat

Wapiti Or Elk	European Starling
Mule Deer	Blackpoll Warbler
White-tailed Deer	Rose-breasted Grosbeak
Pronghorn	House Sparrow
Painted Turtle	House Mouse
Racer	Common Raccoon
Gopher Snake	
Western Terrestrial Garter Snake	
Plains Garter Snake	
TIER IV: 25	
Great Egret	
Brant	
Eurasian Wigeon	
Broad-winged Hawk	
Gray Partridge	
Ring-necked Pheasant	
Wild Turkey	
Black-bellied Plover	
Semipalmated Plover	
Whimbrel	
Hudsonian Godwit	
Red Knot	
Sanderling	
Stilt Sandpiper	
Buff-breasted Sandpiper	
Red-necked Phalarope	
Bonaparte's Gull	
Rock Dove	
Gray-cheeked Thrush	

14564 **Table 37. Powder River Basin/Breaks/Scoria Hills Focus Area-Species Associations**

14565

TOTAL: 299	Milk Snake	Upland Sandpiper	Lark Bunting	Sagebrush Lizard
Group Breakdown Amphibians: 6 Birds: 219 Mammals: 61 Reptiles: 13		Franklin's Gull	Grasshopper Sparrow	Common Garter Snake
	TIER II: 81	Caspian Tern	Le Conte's Sparrow	Western Rattlesnake
	Tiger Salamander	Common Tern	Mccown's Longspur	
	Great Plains Toad	Forster's Tern	Bullock's Oriole	TIER III: 180
TIER I: 19	Woodhouse's Toad	Black-billed Cuckoo	Preble's Shrew	Boreal Chorus Frog
	Plains Spadefoot	Yellow-billed Cuckoo	Dwarf Shrew	Pied-billed Grebe
	Horned Grebe	Barn Owl	Merriam's Shrew	Eared Grebe
	Western Grebe	Northern Saw-whet Owl	Hayden's Shrew	American White Pelican
Northern Leopard Frog	American Bittern	Lewis' Woodpecker	Yuma Myotis	Double-crested Cormorant
Common Loon	Black-crowned Night-heron	Cassin's Kingbird	Long-eared Myotis	Great Blue Heron
Trumpeter Swan	Canvasback	Pinyon Jay	Long-legged Myotis	Cattle Egret
Bald Eagle	Redhead	White-breasted Nuthatch	Western Small-footed Myotis	Tundra Swan
Sage-grouse	Hooded Merganser	Pygmy Nuthatch	Silver-haired Bat	Greater White-fronted Goose
Whooping Crane	Turkey Vulture	Brown Creeper	Big Brown Bat	Snow Goose
Long-billed Curlew	Northern Harrier	Canyon Wren	Eastern Red Bat	Canada Goose
Black Tern	Sharp-shinned Hawk	Winter Wren	Hoary Bat	Wood Duck
Burrowing Owl	Cooper's Hawk	Veery	Mountain Cottontail	Green-winged Teal
Spotted Bat	Northern Goshawk	Sprague's Pipit	White-tailed Jackrabbit	American Black Duck
Townsend's Big-eared Bat	Swainson's Hawk	Loggerhead Shrike	Olive-backed Pocket Mouse	Mallard
Black-tailed Prairie Dog	Ferruginous Hawk	Black-and-white Warbler	Ord's Kangaroo Rat	Northern Pintail
Meadow Jumping Mouse	Golden Eagle	American Redstart	White-footed Mouse	Blue-winged Teal
Black-footed Ferret	Merlin	Yellow-breasted Chat	Sagebrush Vole	Cinnamon Teal
American Bison	Peregrine Falcon	Indigo Bunting	Swift Fox	Northern Shoveler
Snapping Turtle	Prairie Falcon	Green-tailed Towhee	American Badger	Gadwall
Spiny Softshell	Blue Grouse	Brewer's Sparrow	Northern River Otter	American Wigeon
Western Hognose Snake	Greater Sandhill Crane	Field Sparrow	Short-horned Lizard	Ring-necked Duck

14566

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Lesser Scaup	Wilson's Phalarope	Bank Swallow	Common Yellowthroat	Evening Grosbeak
Common Goldeneye	Ring-billed Gull	Cliff Swallow	Wilson's Warbler	Masked Shrew
Barrow's Goldeneye	California Gull	Barn Swallow	Western Tanager	Water Shrew
Bufflehead	Herring Gull	Blue Jay	Black-headed Grosbeak	Little Brown Myotis
Common Merganser	Mourning Dove	Clark's Nutcracker	Lazuli Bunting	Desert Cottontail
Red-breasted Merganser	Eastern Screech-owl	Black-billed Magpie	Spotted Towhee	Least Chipmunk
Ruddy Duck	Great Horned Owl	American Crow	American Tree Sparrow	Yellow-bellied Marmot
Osprey	Snowy Owl	Black-capped Chickadee	Chipping Sparrow	Thirteen-lined Ground Squirrel
Red-tailed Hawk	Long-eared Owl	Red-breasted Nuthatch	Vesper Sparrow	Eastern Fox Squirrel
Rough-legged Hawk	Short-eared Owl	Rock Wren	Lark Sparrow	Red Squirrel
American Kestrel	Common Nighthawk	House Wren	Savannah Sparrow	Northern Pocket Gopher
Gyr Falcon	Common Poorwill	Marsh Wren	Song Sparrow	American Beaver
Ruffed Grouse	Chimney Swift	Golden-crowned Kinglet	White-crowned Sparrow	Western Harvest Mouse
Virginia Rail	White-throated Swift	Ruby-crowned Kinglet	Dark-eyed Junco	Deer Mouse
Sora	Belted Kingfisher	Mountain Bluebird	Lapland Longspur	Northern Grasshopper Mouse
American Coot	Red-naped Sapsucker	Townsend's Solitaire	Chestnut-collared Longspur	Bushy-tailed Woodrat
Lesser Sandhill Crane	Downy Woodpecker	Swainson's Thrush	Bobolink	Southern Red-backed Vole
Killdeer	Hairy Woodpecker	American Robin	Red-winged Blackbird	Meadow Vole
American Avocet	Northern Flicker	Gray Catbird	Western Meadowlark	Long-tailed Vole
Greater Yellowlegs	Western Wood-pewee	Northern Mockingbird	Yellow-headed Blackbird	Prairie Vole
Lesser Yellowlegs	Willow Flycatcher	Sage Thrasher	Brewer's Blackbird	Muskrat
Solitary Sandpiper	Least Flycatcher	Brown Thrasher	Common Grackle	Western Jumping Mouse
Willet	Dusky Flycatcher	American Pipit	Brown-headed Cowbird	Common Porcupine
Spotted Sandpiper	Say's Phoebe	Bohemian Waxwing	Cassin's Finch	Coyote
Semipalmated Sandpiper	Western Kingbird	Cedar Waxwing	House Finch	Red Fox
Least Sandpiper	Eastern Kingbird	Northern Shrike	Red Crossbill	Black Bear
Baird's Sandpiper	Horned Lark	Red-eyed Vireo	Common Redpoll	Long-tailed Weasel
Pectoral Sandpiper	Tree Swallow	Yellow Warbler	Hoary Redpoll	Mink
Long-billed Dowitcher	Violet-green Swallow	Yellow-rumped Warbler	Pine Siskin	Striped Skunk
Common Snipe	Northern Rough-winged Swallow	Ovenbird	American Goldfinch	Wapiti Or Elk

Mule Deer
White-tailed Deer
Pronghorn
Painted Turtle
Racer
Gopher Snake
Western Terrestrial Garter Snake
Plains Garter Snake
TIER IV: 19
Surf Scoter
Broad-winged Hawk
Gray Partridge
Chukar
Ring-necked Pheasant
Wild Turkey
Black-bellied Plover
American Golden-plover
Semipalmated Plover
Whimbrel
Stilt Sandpiper
Red-necked Phalarope
Rock Dove
Yellow-bellied Sapsucker
European Starling
Blackpoll Warbler
House Sparrow
House Mouse
Common Raccoon

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14570 **Table 38. Shale Scablands Focus Area-Species Associations**

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TOTAL: 245	TIER II: 77			
Group Breakdown Amphibians: 6 Birds: 172 Mammals: 55 Reptiles: 12	Tiger Salamander	Black-billed Cuckoo	Bullock's Oriole	Pied-billed Grebe
	Great Plains Toad	Yellow-billed Cuckoo	Dwarf Shrew	Eared Grebe
	Woodhouse's Toad	Barn Owl	Merriam's Shrew	American White Pelican
	Plains Spadefoot	Northern Saw-whet Owl	Hayden's Shrew	Double-crested Cormorant
	Horned Grebe	Lewis' Woodpecker	Long-eared Myotis	Great Blue Heron
	Western Grebe	Red-headed Woodpecker	Long-legged Myotis	Canada Goose
	American Bittern	Cassin's Kingbird	Western Small-footed Myotis	Green-winged Teal
TIER I: 17	Black-crowned Night-heron	Pinyon Jay	Silver-haired Bat	Mallard
Northern Leopard Frog	Canvasback	White-breasted Nuthatch	Big Brown Bat	Northern Pintail
Common Loon	Redhead	Pygmy Nuthatch	Eastern Red Bat	Blue-winged Teal
Bald Eagle	Hooded Merganser	Brown Creeper	Hoary Bat	Cinnamon Teal
Sage-grouse	Turkey Vulture	Canyon Wren	Eastern Cottontail	Northern Shoveler
Whooping Crane	Northern Harrier	Winter Wren	White-tailed Jackrabbit	Gadwall
Mountain Plover	Sharp-shinned Hawk	Eastern Bluebird	Olive-backed Pocket Mouse	American Wigeon
Long-billed Curlew	Cooper's Hawk	Veery	Hispid Pocket Mouse	Ring-necked Duck
Black Tern	Northern Goshawk	Sprague's Pipit	White-footed Mouse	Lesser Scaup
Burrowing Owl	Swainson's Hawk	Loggerhead Shrike	Sagebrush Vole	Bufflehead
Townsend's Big-eared Bat	Ferruginous Hawk	Black-and-white Warbler	Swift Fox	Common Merganser
Black-tailed Prairie Dog	Golden Eagle	American Redstart	American Badger	Ruddy Duck
Meadow Jumping Mouse	Merlin	Yellow-breasted Chat	Northern River Otter	Osprey
Black-footed Ferret	Peregrine Falcon	Indigo Bunting	Short-horned Lizard	Red-tailed Hawk
Snapping Turtle	Prairie Falcon	Clay-colored Sparrow	Sagebrush Lizard	Rough-legged Hawk
Spiny Softshell	Greater Sandhill Crane	Brewer's Sparrow	Common Garter Snake	American Kestrel
Western Hognose Snake	Upland Sandpiper	Field Sparrow	Western Rattlesnake	Gyr Falcon
Milk Snake	Franklin's Gull	Lark Bunting		Sharp-tailed Grouse
	Forster's Tern	Baird's Sparrow	TIER III: 138	Sora
		Grasshopper Sparrow	Boreal Chorus Frog	American Coot

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Lesser Sandhill Crane	Violet-green Swallow	Song Sparrow	Meadow Vole	European Starling
Killdeer	Northern Rough-winged Swallow	Lincoln's Sparrow	Long-tailed Vole	Blackpoll Warbler
Greater Yellowlegs	Cliff Swallow	White-throated Sparrow	Prairie Vole	House Sparrow
Lesser Yellowlegs	Barn Swallow	White-crowned Sparrow	Muskrat	House Mouse
Solitary Sandpiper	Clark's Nutcracker	Chestnut-collared Longspur	Common Porcupine	Common Raccoon
Willet	Red-breasted Nuthatch	Snow Bunting	Coyote	
Spotted Sandpiper	House Wren	Bobolink	Red Fox	
Western Sandpiper	Golden-crowned Kinglet	Red-winged Blackbird	Long-tailed Weasel	
Least Sandpiper	Mountain Bluebird	Western Meadowlark	Mink	
Dunlin	American Robin	Yellow-headed Blackbird	Striped Skunk	
Long-billed Dowitcher	Gray Catbird	Brewer's Blackbird	Bobcat	
Common Snipe	Sage Thrasher	Common Grackle	Wapiti Or Elk	
Wilson's Phalarope	Brown Thrasher	Brown-headed Cowbird	Mule Deer	
Ring-billed Gull	American Pipit	Orchard Oriole	White-tailed Deer	
California Gull	Bohemian Waxwing	Red Crossbill	Pronghorn	
Mourning Dove	Cedar Waxwing	American Goldfinch	Bighorn Sheep	
Snowy Owl	Northern Shrike	Masked Shrew	Painted Turtle	
Short-eared Owl	Orange-crowned Warbler	Dusky Or Montane Shrew	Racer	
Common Nighthawk	Yellow Warbler	Little Brown Myotis	Western Terrestrial Garter Snake	
Belted Kingfisher	Northern Waterthrush	Desert Cottontail	Plains Garter Snake	
Downy Woodpecker	Common Yellowthroat	Least Chipmunk		
Northern Flicker	Wilson's Warbler	Thirteen-lined Ground Squirrel	TIER IV: 13	
Western Wood-pewee	Black-headed Grosbeak	Eastern Fox Squirrel	Least Bittern	
Willow Flycatcher	Dickcissel	Red Squirrel	Great Egret	
Least Flycatcher	Spotted Towhee	Northern Pocket Gopher	Gray Partridge	
Say's Phoebe	American Tree Sparrow	American Beaver	Ring-necked Pheasant	
Western Kingbird	Chipping Sparrow	Western Harvest Mouse	Black-bellied Plover	
Eastern Kingbird	Vesper Sparrow	Deer Mouse	Stilt Sandpiper	
Horned Lark	Lark Sparrow	Northern Grasshopper Mouse	Rock Dove	
Tree Swallow	Savannah Sparrow	Bushy-tailed Woodrat	Eastern Wood-pewee	

14574 **Table 39. Middle Missouri River Focus Area-Species Associations**

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TOTAL: 67	TIER III: 31	Iowa Darter	Walleye
Group Breakdown Fish: 62 Crayfish: 2 Mussels: 3	Mottled Sculpin	Calico Crayfish	
	Shovelnose Sturgeon	Virile Crayfish	
	Goldeye	Fatmucket	
	Lake Whitefish	Giant Floater	
	Mountain Whitefish		
	Lake Chub	TIER IV: 21	
TIER I: 9	Western Silvery Minnow	Cisco	
Pallid Sturgeon	Brassy Minnow	Chinook Salmon	
Paddlefish	Plains Minnow	Kokanee Salmon	
Shortnose Gar	Emerald Shiner	Rainbow Trout	
Sturgeon Chub	Sand Shiner	Brown Trout	
Sicklefin Chub	Northern Redbelly Dace	Brook Trout	
Blue Sucker	Fathead Minnow	Lake Trout	
Burbot	Longnose Dace	Northern Pike	
Sauger	Creek Chub	Common Carp	
	Flathead Chub	Spottail Shiner	
	River Carpsucker	Black Bullhead	
	Longnose Sucker	Pumpkinseed	
	White Sucker	Plains Killifish	
TIER II: 4	Mountain Sucker	Green Sunfish	
Bigmouth Buffalo	Smallmouth Buffalo	Bluegill	
Freshwater Drum	Shorthead Redhorse	Smallmouth Bass	
Northern Redbelly X Finescale Dace	Channel Catfish	Largemouth Bass	
Black Sandshell	Stonecat	White Crappie	
	Western Mosquitofish	Black Crappie	
	Brook Stickleback	Yellow Perch	

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Table 40. Grassland Complexes Communities-Species Associations

Note: Essentially associated species are bolded in table. Total number of species essentially associated with each community type can be found in parenthesis.

TOTAL: 364 (202)	Flammulated Owl	Pacific Treefrog	Common Tern	Clay-colored Sparrow
Generalist: 162 Amphibians: 3 Birds: 134 Mammals: 20 Reptiles: 5	Burrowing Owl	Plains Spadefoot	Forster's Tern	Brewer's Sparrow
	Sedge Wren	Columbia Spotted Frog	Black-billed Cuckoo	Field Sparrow
	Nelson's Sharp-tailed Sparrow	Horned Grebe	Barn Owl	Lark Bunting
	Spotted Bat	Western Grebe	Northern Hawk Owl	Baird's Sparrow
	Townsend's Big-eared Bat	American Bittern	Northern Pygmy-owl	Grasshopper Sparrow
	Pallid Bat	Black-crowned Night-heron	Black-chinned Hummingbird	Mccown's Longspur
	Pygmy Rabbit	White-faced Ibis	Lewis' Woodpecker	Baltimore Oriole
Essentialists: 202 Amphibians: 7 Birds: 121 Mammals: 62 Reptiles: 12	Black-tailed Prairie Dog	Canvasback	Red-headed Woodpecker	Bullock's Oriole
	White-tailed Prairie Dog	Redhead	Williamson's Sapsucker	Preble's Shrew
	Great Basin Pocket Mouse	Turkey Vulture	Alder Flycatcher	Vagrant Shrew
	Meadow Jumping Mouse	Northern Harrier	Hammond's Flycatcher	Arctic Shrew
	Grizzly Bear	Sharp-shinned Hawk	Cassin's Kingbird	Merriam's Shrew
	Black-footed Ferret	Cooper's Hawk	Pinyon Jay	Hayden's Shrew
TIER I: 32 (23)	Lynx	Northern Goshawk	White-breasted Nuthatch	Yuma Myotis
Boreal Toad	American Bison	Swainson's Hawk	Pygmy Nuthatch	Long-eared Myotis
Northern Leopard Frog	Snapping Turtle	Ferruginous Hawk	Canyon Wren	Long-legged Myotis
Trumpeter Swan	Spiny Softshell	Golden Eagle	Blue-gray Gnatcatcher	Western Small-footed Myotis
Sage-grouse	Western Hognose Snake	Merlin	Eastern Bluebird	Northern Myotis
Columbia Sharp-tailed Grouse	Milk Snake	Peregrine Falcon	Western Bluebird	Silver-haired Bat
Yellow Rail	Smooth Green Snake	Prairie Falcon	Veery	Big Brown Bat
Whooping Crane		Blue Grouse	Sprague's Pipit	Eastern Red Bat
Piping Plover	TIER II: 100 (67)	Greater Sandhill Crane	Loggerhead Shrike	Hoary Bat
Mountain Plover	Tiger Salamander	Upland Sandpiper	Black-and-white Warbler	Mountain Cottontail
Long-billed Curlew	Great Plains Toad	Marbled Godwit	American Redstart	White-tailed Jackrabbit
Black Tern	Woodhouse's Toad	Caspian Tern	Green-tailed Towhee	Black-tailed Jackrabbit

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Ord's Kangaroo Rat	Green-winged Teal	Solitary Sandpiper	Hairy Woodpecker	Hermit Thrush
Hispid Pocket Mouse	American Black Duck	Willet	Northern Flicker	American Robin
White-footed Mouse	Mallard	Spotted Sandpiper	Western Wood-pewee	Gray Catbird
Uinta Ground Squirrel	Snow Goose	Black-necked Stilt	Rufous Hummingbird	Ruby-crowned Kinglet
Wyoming Ground Squirrel	Ross' Goose	American Avocet	Belted Kingfisher	Mountain Bluebird
Northern Flying Squirrel	Canada Goose	Greater Yellowlegs	Red-naped Sapsucker	Townsend's Solitaire
Olive-backed Pocket Mouse	Wood Duck	Lesser Yellowlegs	Downy Woodpecker	Swainson's Thrush
Sagebrush Vole	Northern Pintail	Semipalmated Sandpiper	Willow Flycatcher	Northern Mockingbird
Swift Fox	Blue-winged Teal	Western Sandpiper	Dusky Flycatcher	Sage Thrasher
Least Weasel	Cinnamon Teal	Least Sandpiper	Cordilleran Flycatcher	Brown Thrasher
American Badger	Northern Shoveler	White-rumped Sandpiper	Say's Phoebe	American Pipit
Western Spotted Skunk	Gadwall	Baird's Sandpiper	Western Kingbird	Bohemian Waxwing
Northern Alligator Lizard	American Wigeon	Pectoral Sandpiper	Eastern Kingbird	Cedar Waxwing
Short-horned Lizard	Greater Scaup	Dunlin	Horned Lark	Northern Shrike
Sagebrush Lizard	Lesser Scaup	Long-billed Dowitcher	Tree Swallow	Warbling Vireo
Western Skink	Long Tailed Duck	Common Snipe	Violet-green Swallow	Red-eyed Vireo
Rubber Boa	White-winged Scoter	Wilson's Phalarope	Northern Rough-winged Swallow	Orange-crowned Warbler
Common Garter Snake	Common Merganser	Ring-billed Gull	Cliff Swallow	Yellow Warbler
Western Rattlesnake	Red-breasted Merganser	California Gull	Barn Swallow	Yellow-rumped Warbler
	Ruddy Duck	Mourning Dove	Gray Jay	Ovenbird
TIER III: 200 (96)	Red-tailed Hawk	Western Screech-owl	Blue Jay	Northern Waterthrush
Boreal Chorus Frog	Rough-legged Hawk	Great Horned Owl	Clark's Nutcracker	Macgillivray's Warbler
Pied-billed Grebe	American Kestrel	Snowy Owl	Black-billed Magpie	Common Yellowthroat
Eared Grebe	Ruffed Grouse	Long-eared Owl	American Crow	Wilson's Warbler
American White Pelican	Sharp-tailed Grouse	Short-eared Owl	Black-capped Chickadee	Western Tanager
Double-crested Cormorant	Virginia Rail	Common Nighthawk	Mountain Chickadee	Black-headed Grosbeak
Great Blue Heron	Sora	Common Poorwill	Red-breasted Nuthatch	Lazuli Bunting
Snowy Egret	American Coot	Chimney Swift	Rock Wren	Dickcissel
Tundra Swan	Lesser Sandhill Crane	White-throated Swift	House Wren	Spotted Towhee
Greater White-fronted Goose	Killdeer	Calliope Hummingbird	Marsh Wren	American Tree Sparrow

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Song Sparrow	Red-tailed Chipmunk	White-tailed Deer	Pine Warbler
Lincoln's Sparrow	Yellow-bellied Marmot	Pronghorn	Palm Warbler
White-throated Sparrow	Richardson's Ground Squirrel	Painted Turtle	Blackpoll Warbler
Chipping Sparrow	Little Brown Myotis	Striped Skunk	Band-tailed Pigeon
Vesper Sparrow	Desert Cottontail	Bobcat	Ruby-throated Hummingbird
Lark Sparrow	Least Chipmunk	Wapiti Or Elk	Scissor-tailed Flycatcher
Savannah Sparrow	Yellow-pine Chipmunk	Mule Deer	European Starling
White-crowned Sparrow	Columbian Ground Squirrel	Racer	Hooded Warbler
Harris' Sparrow	Thirteen-lined Ground Squirrel	Gopher Snake	Scarlet Tanager
Dark-eyed Junco	Golden-mantled Ground Squirrel	Western Terrestrial Garter Snake	Rose-breasted Grosbeak
Lapland Longspur	Red Squirrel	Plains Garter Snake	Golden-crowned Sparrow
Chestnut-collared Longspur	Northern Pocket Gopher		House Sparrow
Bobolink	American Beaver	TIER IV: 32 (16)	House Mouse
Red-winged Blackbird	Western Harvest Mouse	Canadian Toad	Common Raccoon
Western Meadowlark	Deer Mouse	Great Egret	Feral Horse
Yellow-headed Blackbird	Northern Grasshopper Mouse	Little Blue Heron	
Brewer's Blackbird	Bushy-tailed Woodrat	Green Heron	
Common Grackle	Meadow Vole	Eurasian Wigeon	
Brown-headed Cowbird	Montane Vole	Surf Scoter	
Brambling	Long-tailed Vole	Broad-winged Hawk	
Purple Finch	Prairie Vole	Gray Partridge	
Cassin's Finch	Muskrat	Ring-necked Pheasant	
House Finch	Western Jumping Mouse	Wild Turkey	
Red Crossbill	Common Porcupine	Black-bellied Plover	
Common Redpoll	Coyote	Semipalmated Plover	
Pine Siskin	Red Fox	Whimbrel	
American Goldfinch	Black Bear	Red Knot	
Evening Grosbeak	Ermine	Sanderling	
Masked Shrew	Long-tailed Weasel	Stilt Sandpiper	
Dusky Or Montane Shrew	Mink	Rock Dove	

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Table 41. Mixed Broadleaf Forest Communities-Species Associations

Note: Essentially associated species are bolded in table. Total number of species essentially associated with each community type can be found in parenthesis.

TOTAL: 26(5)	Ovenbird
Generalists: 21 Birds: 15 Mammals: 6	Common Yellowthroat Snow Bunting Thirteen-lined Ground Squirrel American Beaver Deer Mouse
Essentialists: 5 Birds: 3 Mammals: 2	Coyote Wapiti Or Elk White-tailed Deer Moose
TIER II: 5 (1)	Bighorn Sheep
American Bittern Blue Grouse Veery Black-and-white Warbler Yellow-breasted Chat	TIER IV: 2 (0) Red-necked Phalarope Ruby-throated Hummingbird
TIER III: 19 (4)	
Eastern Screech-owl Western Screech-owl Least Flycatcher Blue Jay House Wren American Dipper Bohemian Waxwing Red-eyed Vireo	

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Table 42. Mixed Shrub/Grass Associations Communities-Species Associations

Note: Essentially associated species are bolded in table. Total number of species essentially associated with each community type can be found in parenthesis.

TOTAL: 39 (10)	Ferruginous Hawk	Northern Grasshopper Mouse
Generalists: 29 Amphibians: 4 Birds: 17 Mammals: 6 Reptiles: 2	Upland Sandpiper Yellow-billed Cuckoo Barn Owl Red-headed Woodpecker Pinyon Jay Blue-gray Gnatcatcher Veery McCown's Longspur Bullock's Oriole Dwarf Shrew Eastern Cottontail Ord's Kangaroo Rat Sagebrush Lizard	Prairie Vole Gopher Snake
Essentialists: 10 Birds: 3 Mammals: 5 Reptiles: 2		TIER IV: 2 (0)
TIER 1: 7 (3)		Broad-winged Hawk Ring-necked Pheasant
Sage-grouse Mountain Plover Burrowing Owl Spotted Bat Black-tailed Prairie Dog Western Hognose Snake Milk Snake	TIER III: 13 (2)	
TIER II: 17 (5)	Boreal Chorus Frog Gyr Falcon Chimney Swift Western Kingbird Bank Swallow Spotted Towhee Desert Cottontail Least Chipmunk Western Harvest Mouse Deer Mouse	
Woodhouse's Toad Pacific Treefrog Plains Spadefoot		

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Table 43. Riparian & Wetland Communities-Species Associations

Note: Essentially associated species are bolded in table. Total number of species essentially associated with each community type can be found in parenthesis.

TOTAL: 265 (193)	Townsend's Big-eared Bat	Northern Harrier	Merriam's Shrew	Great Basin Spadefoot
Generalists: 72 Birds: 32 Mammals: 35 Reptiles: 5	Pygmy Rabbit	Cooper's Hawk	Pygmy Shrew	Pied-billed Grebe
Essentialists: 193 Amphibians: 16 Birds: 149 Mammals: 22 Reptiles: 6	Northern Bog Lemming	Upland Sandpiper	Hayden's Shrew	Eared Grebe
	Meadow Jumping Mouse	Marbled Godwit	Yuma Myotis	Clark's Grebe
	Snapping Turtle	Franklin's Gull	Long-eared Myotis	American White Pelican
	Spiny Softshell	Caspian Tern	Fringed Myotis	Double-crested Cormorant
	Western Hognose Snake	Common Tern	Silver-haired Bat	Great Blue Heron
		Forster's Tern	Big Brown Bat	Snowy Egret
	TIER II: 66 (39)	Northern Saw-whet Owl	Eastern Red Bat	Cattle Egret
	Long-toed Salamander	Black Swift	Eastern Cottontail	Tundra Swan
	Tiger Salamander	Lewis' Woodpecker	White-tailed Jackrabbit	Greater White-fronted Goose
	Tailed Frog	Red-headed Woodpecker	Uinta Ground Squirrel	Snow Goose
TIER I: 20 (17)	Great Plains Toad	Pileated Woodpecker	Northern Flying Squirrel	Ross' Goose
Coeur D'alene Salamander	Woodhouse's Toad	Alder Flycatcher	Idaho Pocket Gopher	Canada Goose
Boreal Toad	Pacific Treefrog	Cassin's Kingbird	White-footed Mouse	Wood Duck
Northern Leopard Frog	Plains Spadefoot	Chestnut-backed Chickadee	Water Vole	Green-winged Teal
Common Loon	Columbia Spotted Frog	American Redstart	American Marten	American Black Duck
Trumpeter Swan	Horned Grebe	Yellow-breasted Chat	Least Weasel	Mallard
Harlequin Duck	Red-necked Grebe	Clay-colored Sparrow	Western Spotted Skunk	Northern Pintail
Bald Eagle	Western Grebe	Field Sparrow	Northern River Otter	Blue-winged Teal
Yellow Rail	American Bittern	Le Conte's Sparrow	Sagebrush Lizard	Cinnamon Teal
Piping Plover	Black-crowned Night-heron	Baltimore Oriole	Common Garter Snake	Northern Shoveler
Least Tern	White-faced Ibis	Bullock's Oriole	Western Rattlesnake	Gadwall
Black Tern	Canvasback	Preble's Shrew		American Wigeon
Sedge Wren	Redhead	Vagrant Shrew	TIER III: 134 (95)	Ring-necked Duck
Nelson's Sharp-tailed Sparrow	Hooded Merganser	Arctic Shrew	Boreal Chorus Frog	Greater Scaup

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Lesser Scaup	Wilson's Phalarope	Common Yellowthroat	Heather Vole	Wood Stork
Long Tailed Duck	Ring-billed Gull	Black-headed Grosbeak	Long-tailed Vole	Mute Swan
White-winged Scoter	California Gull	American Tree Sparrow	Prairie Vole	Brant
Common Goldeneye	Herring Gull	Savannah Sparrow	Muskrat	Garganey
Barrow's Goldeneye	Glaucous-winged Gull	Swamp Sparrow	Western Jumping Mouse	Eurasian Wigeon
Bufflehead	Glaucous Gull	Lapland Longspur	Long-tailed Weasel	Black Scoter
Common Merganser	Arctic Tern	Bobolink	Mink	Surf Scoter
Red-breasted Merganser	Mourning Dove	Red-winged Blackbird	Striped Skunk	Black-bellied Plover
Ruddy Duck	Eastern Screech-owl	Yellow-headed Blackbird	Mule Deer	American Golden-plover
Osprey	Belted Kingfisher	Rusty Blackbird	White-tailed Deer	Semipalmated Plover
Ruffed Grouse	Downy Woodpecker	Brewer's Blackbird	Moose	Whimbrel
Virginia Rail	Willow Flycatcher	Common Grackle	Pronghorn	Hudsonian Godwit
Sora	Least Flycatcher	Common Redpoll	Painted Turtle	Ruddy Turnstone
American Coot	Eastern Kingbird	American Goldfinch	Racer	Black Turnstone
Killdeer	Tree Swallow	Masked Shrew	Gopher Snake	Red Knot
Black-necked Stilt	Northern Rough-winged Swallow	Dusky Or Montane Shrew	Western Terrestrial Garter Snake	Sanderling
American Avocet	Cliff Swallow	Water Shrew	Plains Garter Snake	Curlew Sandpiper
Greater Yellowlegs	Barn Swallow	Little Brown Myotis		Stilt Sandpiper
Lesser Yellowlegs	Black-billed Magpie	Snowshoe Hare	TIER IV: 45 (42)	Buff-breasted Sandpiper
Willet	American Crow	Least Chipmunk	Canadian Toad	Short-billed Dowitcher
Spotted Sandpiper	House Wren	Yellow-pine Chipmunk	Bullfrog	Red-necked Phalarope
Semipalmated Sandpiper	Marsh Wren	Red-tailed Chipmunk	Wood Frog	Red Phalarope
Western Sandpiper	American Dipper	Richardson's Ground Squirrel	Red-throated Loon	Pomarine Jaeger
Least Sandpiper	Gray Catbird	Columbian Ground Squirrel	Pacific Loon	Bonaparte's Gull
White-rumped Sandpiper	Brown Thrasher	Thirteen-lined Ground Squirrel	Yellow-billed Loon	Mew Gull
Baird's Sandpiper	Northern Shrike	Eastern Fox Squirrel	Least Bittern	Thayer's Gull
Pectoral Sandpiper	Red-eyed Vireo	American Beaver	Great Egret	Eastern Wood-pewee
Dunlin	Yellow Warbler	Deer Mouse	Little Blue Heron	European Starling
Long-billed Dowitcher	Ovenbird	Bushy-tailed Woodrat	Green Heron	Palm Warbler
Common Snipe	Northern Waterthrush	Southern Red-backed Vole	Yellow-crowned Night-heron	Mourning Warbler

Hooded Warbler
Canada Warbler
Northern Short-tailed Shrew
Common Raccoon

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Table 44. Sagebrush & Salt Flat Communities Species-Associations

Note: Essentially associated species are bolded in table. Total number of species essentially associated with each community type can be found in parenthesis.

TOTAL: 81 (23)	Milk Snake	Ord's Kangaroo Rat	Vesper Sparrow
Generalists: 58	TIER II: 31 (9)	Sagebrush Vole	Lark Sparrow
Amphibians: 3	Tiger Salamander	American Badger	Sage Sparrow
Birds: 32	Plains Spadefoot	Western Spotted Skunk	Savannah Sparrow
Mammals: 16	Northern Harrier	Short-horned Lizard	Western Meadowlark
Reptiles: 7	Swainson's Hawk	Sagebrush Lizard	Brewer's Blackbird
	Ferruginous Hawk	Western Rattlesnake	Desert Cottontail
Essentialists: 23	Golden Eagle		Least Chipmunk
Amphibians: 1	Prairie Falcon	TIER III: 35 (7)	Northern Pocket Gopher
Birds: 8	Upland Sandpiper	Boreal Chorus Frog	Deer Mouse
Mammals: 13	Blue-gray Gnatcatcher	Great Basin Spadefoot	Northern Grasshopper Mouse
Reptiles: 1	Loggerhead Shrike	American Kestrel	Montane Vole
	Indigo Bunting	Short-eared Owl	Common Porcupine
TIER I: 13 (7)	Green-tailed Towhee	Say's Phoebe	Red Fox
Sage-grouse	Brewer's Sparrow	Western Kingbird	Mule Deer
Mountain Plover	Grasshopper Sparrow	Eastern Kingbird	Pronghorn
Long-billed Curlew	Baltimore Oriole	Horned Lark	Racer
Burrowing Owl	Preble's Shrew	Violet-green Swallow	Gopher Snake
Spotted Bat	Merriam's Shrew	Cliff Swallow	
Pallid Bat	Long-eared Myotis	Barn Swallow	TIER IV: 2 (0)
Pygmy Rabbit	Western Small-footed Myotis	Black-billed Magpie	Gray Partridge
Black-tailed Prairie Dog	Mountain Cottontail	Rock Wren	Chukar
White-tailed Prairie Dog	Black-tailed Jackrabbit	Mountain Bluebird	
Great Basin Pocket Mouse	Wyoming Ground Squirrel	Sage Thrasher	
Snapping Turtle	Idaho Pocket Gopher	Bohemian Waxwing	
Western Hognose Snake	Olive-backed Pocket Mouse	American Tree Sparrow	

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Table 45. Mountain Stream Communities-Species Associations

Note: Essentially associated species are bolded in table. Total number of species essentially associated with each community type can be found in parenthesis

TOTAL: 18 (17)	Longnose Dace
Generalists: 1 Fish: 1	Redside Shiner Longnose Sucker Mountain Sucker Signal Crayfish
Essentialists: 17 Fish: 15 Mussels: 1 Crayfish: 1	TIER IV: 2 (2)
TIER 1: 6 (6)	Rainbow Trout Brook Trout
Yellowstone Cutthroat Trout Westslope Cutthroat Trout Columbia Basin Redband Trout Bull Trout Arctic Grayling Western Pearlshell	
TIER II: 2 (2)	
Torrent Sculpin Spoonhead Sculpin	
TIER III: 8 (7)	
Mottled Sculpin Slimy Sculpin Pygmy Whitefish	

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Table 46. Prairie Stream Communities-Species Associations

Note: Essentially associated species are bolded in table. Total number of species essentially associated with each community type can be found in parenthesis

TOTAL: 32 (25)	Flathead Chub
Generalists: 7 Fish: 7 Essentialists: 25 Fish: 21 Crayfish: 2 Mussels: 2	White Sucker Mountain Sucker Smallmouth Buffalo Stonecat Brook Stickleback Iowa Darter Calico Crayfish Virile Crayfish
TIER I: 1 (1)	Fatmucket
Pearl Dace	Giant Floater
TIER II: 1 (1)	TIER IV: 9 (6)
Northern Redbelly X Finescale Dace	Golden Shiner
	Black Bullhead
TIER III: 21 (17)	Yellow Bullhead
Lake Chub	Plains Killifish
Western Silvery Minnow	Green Sunfish
Brassy Minnow	Bluegill
Plains Minnow	Largemouth Bass
Emerald Shiner	Black Crappie
Sand Shiner	Yellow Perch
Northern Redbelly Dace	
Flathead Minnow	
Longnose Dace	
Creek Chub	

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Appendices

Appendix A

Guiding Principles for States to Consider in Developing Comprehensive Wildlife Conservation Plans and Wildlife Conservation Strategies (Plans-Strategies) for the State Wildlife Grant and Wildlife Conservation and Restoration Programs

Final: September 27, 2002

The International Association of Fish and Wildlife Agencies recommends the following guiding principles for the States, the U.S. Fish and Wildlife Service, and their conservation partners to consider and apply while developing Comprehensive Wildlife Conservation Plans to meet their obligations under the State Wildlife Grant (SWG) and the Wildlife Conservation Strategies under the Wildlife Conservation and Restoration (WCRP) programs.

These Guiding Principles identify goals, objectives, and actions to strive for over time. Few if any will be fully realized in any State under what is hopefully just the first round of conservation program development under SWG and WCRP. Some things must occur from the outset, because they are legally required and/or because they are essential to success. Clearly, broad-scale public participation is an example of one such area. Among the diverse stakeholders in this effort are: private, local, State, and Federal agencies and governments, NGOs, etc.

The Plan-Strategy provides an opportunity for the State wildlife agency to provide effective and visionary leadership in conservation. The Plan-Strategy can identify the measures that will be used, the results achieved, and the threats and needs that remain with regard to wildlife and wildlife habitat. It is also an opportunity to address broader issues and programs, including environmental and wildlife-related education, outdoor recreation, and wildlife-related law enforcement. These other areas can constrain, or enhance, wildlife conservation efforts, and funding and public support for wildlife conservation can be increased, or at least stretched, by involving partners that share those interests.

A: Planning Process and Partnerships

1. Involve multiple staff levels within each agency, and broad public-private partnerships, to develop and implement the Plan-Strategy.
2. Involve partners that have the authorities necessary to ensure that the Plan-Strategy addresses the full range of issues at hand.
3. Build capacity for cooperative engagement among all partners in the effort, and make sure that it is productive, so trust and confidence grow, and organizational and interpersonal relationships become strengths of the Plan-Strategy.
4. Share responsibility and credit for planning and implementation among all partners, who collectively share responsibility for success of the Plan-Strategy.
5. Focus on efficiency and effectiveness, so the value added in planning and implementation is commensurate to the funds invested.
6. Ensure that the planning processes and the resultant Plans-Strategies are dynamic — so they can be improved and updated efficiently as new information is gained.
7. Communicate effectively with stakeholders, other partners, and the public, early and often.
8. The planning processes, and the decisions made during planning, should be obvious to those who read and use the Plan-Strategy, and repeatable — document the processes and the decisions so the next planning cycle can build on this one.

B. Focus and Scope

1. Base the Plan-Strategy in the principles of “best science,” “best management practices,” and “adaptive management,” with measurable goals, objectives, strategies, approaches, and activities that are complete, realistic, feasible, logical, and achievable. Describe these processes and practices sufficiently that partners understand what they entail and how they should function.

2. Address the broad range of wildlife and associated habitats, with appropriate priority placed on those species of greatest conservation need and taking into account the relative level of funding available for conservation of those species.
3. Integrate and address wildlife-related issues statewide, across jurisdictions and interests, and coordinate with parallel efforts in other States and countries.
4. Combine landscape/ecotype/habitat-based approaches and smaller-scale approaches (e.g. focal, keystone, and/or indicator species; guilds; species of special concern) for planning and implementation.
5. Make the Plan-Strategy an effective, long-lasting blueprint for conservation that provides a broad vision and priorities, so a broad array of organizations, including other government agencies and NGOs, can help realize the vision. The Plan-Strategy should have sufficient flexibility to respond to the full spectrum of conditions and circumstances likely to be encountered within the planning area.

C. Format and Content

1. Make the Plan-Strategy readable, understandable, and useful, with well-defined issues, short and long-term goals and objectives, strategies, and realistic measures of performance that enable State agencies and their partners to demonstrate accountability.
2. Make full and effective use of relevant existing information; in particular, integrate appropriate elements of other plans and initiatives (such as Partners-in-Flight and the many regional and other plans), databases, GIS layers, records, reports, other information sources, and management information systems that overlap or complement these Plans-Strategies.
3. Identify knowledge gaps, as well as areas of knowledge, to help focus future efforts to improve understanding and planning, but do not allow a lack of information to inappropriately limit necessary short-term application of the best available science and good judgment in decision-making.
4. Make the Plan-Strategy spatially explicit, to the extent feasible and appropriate, with a full complement of GIS and other maps, figures, and other graphics, as well as appropriate text to provide sufficient detail and consistency in describing species and habitat conditions, conservation needs, conservation recommendations, and other issues/actions, so it can be used effectively by all partners.
5. Use “threats analyses,” “risk and stressor assessments,” and other techniques to help set priorities for goals, objectives, strategies, and activities.
6. In addition to wildlife, address factors that can have substantial impact on wildlife conservation, such as management of invasive species, wildlife-

- 16994 related and conservation-related education, law enforcement, and outdoor
16995 recreation.
- 16996 7. Include a comprehensive glossary, so partners and the public have a
16997 shared and common understanding of key terms used in the Plan-
16998 Strategy.
- 16999 8. Develop an updatable information system to monitor Plan-Strategy
17000 implementation and the status and trends of wildlife and habitat.
- 17001 9. Consider wildlife conservation-related education and wildlife-associated
17002 recreation as tools that can help accomplishing conservation goals.

17003

17004 D. Completion, Outcomes, and Availability

17005

- 17006 1. Provide annual written progress updates on the planning effort and
17007 progress to IAFWA's CARA Implementation Committee each September,
17008 in addition to annual performance reports that must be submitted to the
17009 U.S. Fish and Wildlife Service pursuant to Federal Aid guidelines.
- 17010 2. Ensure that the Plan-Strategy clearly and definitively meets State
17011 obligations to Congress under the WCRP and SWG legislation, and to the
17012 U.S. Fish and Wildlife Service with regard to Federal Aid administration.
- 17013 3. Provide sufficient documentation in or with the Plan-Strategy to facilitate
17014 public understanding of the decisions that are made, how and why they
17015 were made.
- 17016 4. Make the Plan-Strategy a driving force in guiding activities under diverse
17017 wildlife and habitat conservation initiatives, and usable for helping to
17018 inform land-use decision-making.
- 17019 5. Make the Plan-Strategy readily available to the public in variety of media
- 17020 6. Provide a mechanism for reporting accomplishments and tracking
17021 progress so local partners are aware of both.
- 17022 7. Ensure that the Plan-Strategy can be implemented, i.e. that it is
17023 administratively and politically feasible, and that there are sufficient
17024 resources (funding and staff) among the partners to accomplish significant
17025 gains at a large scale, and within an appropriate time frame, to preserve
17026 our Nation's wildlife heritage.

17027

17028 **Appendix B**

17029

17030 **Process for Allocating Annual State Wildlife Grant Funds**

17031

17032 *This framework applies to the allocation of Montana's State Wildlife Grant funds*
17033 *only until the approval of the Comprehensive Fish and Wildlife Plan. Following*
17034 *that approval, project selection and fund allocation will be based on the plan.*

1. Appropriation passes Congress and apportionment to Montana is determined.
2. Chief of Staff determines if spending authority is available for fiscal year and alerts Technical Committee if paperwork needed. Overhead portion is determined and total amount available is provided to Technical Committee
3. Within 1 month after apportionment is determined: Steering Committee establishes program-level allocation of funds, if necessary. (Program level allocations could include a percentage to Conservation and Education, if appropriate, or tribal subgrants.)
4. Development of Recommended Projects (Completed within 3 months after program-level allocations are set). - Technical Committee Recommended projects will be generated by:
 - Review of proposals provided in previous year that were not funded.
 - Review of projects that were “multi-year” from previous allocations
 - Generate list of conservation needs
 - Solicit new projects
 - Internal Solicitation– List of Conservation Needs and Request for Proposals (Appendix A) sent to FWP staff; Division Leads contact the appropriate staff in their divisions for proposals and help fleshing out ideas. Fleshing out needs to include a general discussion of match opportunities for the project.
 - External Solicitation – Project leads will contact partners to solicit projects that will align with conservation needs;
 - Determines feasibility through follow-up contacts to identify match, personnel needs, etc. and enter into Table 1.
 - Develops recommendations based on selection criteria (Appendix B)
5. 3 months after program-level allocations are set: Steering Committee reviews and acts on Technical Committee recommendations on projects; revises program-level allocations of uncommitted funds.

Appendix C

Fish, Wildlife & Parks State Wildlife Grant Program Request for Proposals

FWP has receiving their 3rd allocation of funds from Congress for State Wildlife Grants (SWG) in the amount of \$840,000 (after overhead has been removed). The Director's office has allocated \$250,000 each to the Fisheries and Wildlife divisions. An additional \$300,000 is available for projects that may have been solicited internally/externally, can be multi-disciplinary in nature and will be ranked on a competitive basis. **Projects will also be solicited outside the**

agency and projects will be based on merit; this is just a request for proposals, not a guarantee that you will receive the funding.

Congress has directed that the funds be used to address the state's **greatest conservation needs** that are currently **unmet**. Typically, projects to be funded with SWG dollars will involve Montana's Species of Concern and/or other nongame species for which funding is very limited or unavailable. Wildlife projects that have been funded with previous allocations include: sage-grouse surveys (identification of leks and wintering areas); evaluation of recreational shooting on prairie dogs; surveys of small animals associated with sagebrush and grassland habitats; bird monitoring efforts; planning processes; loon monitoring and research; expansion of Montana's coordinated land bird monitoring program and prairie- riparian habitat surveys of eastern Montana. Fisheries projects have included: prairie fish surveys in Regions 4-7, sauger telemetry study in the Powder and Tongue rivers, native species creel, cutthroat restoration in Region 4, and burbot status assessment

Please provide the following information by (date):

- A brief project proposal including the location, the objectives, and deliverables (one page);
- An estimated budget;
- Staffing needs (additional FTE would have to be "modified FTE," and while getting modified FTE is not a sure thing, the Fisheries Division has been successful in the past for SWG projects); and
- Projects can be for more than one year; please reflect that in your proposal.
- Submit Fisheries Projects to Ken McDonald or Wildlife Projects to Heidi Youmans by (insert date)

As you think of potential projects, be mindful of the following information:

- "Interdivisional" projects such as amphibian work or riparian-associated work will be especially welcomed but not mandatory.
- A non-federal match (between 33% and 100% depending on the type of project) is required for all projects. At this time, we are not requiring you to have the match in hand, but do ask that you think about sources of non-federal match. Sources of funds that we cannot use include DJ or PR-funded projects, BPA, USFS and other federal funds. We also can't use the same non-federal funds to match more than one source of federal money. We will work with you on lining out the match if your proposal is selected.
- SWG is administered through the Federal Aid Program, so a project needs to meet all federal aid requirements. We can assist with the necessary paperwork but you will have to ensure enough time so that it can be completed, approved, and the project set up prior to initiation of the project (i.e., plan well ahead of your field season for the project).
- Projects that are eligible for other funding sources will not be scored as high as those without any other potential sources of funding.

After ranking projects based on a set of criteria, the SWG Technical Committee will make recommendations to the SWG Steering Committee who will give final approval to projects.

Appendix D

SWG Project Selection Ranking Criteria

Project (Number or Title): _____

Ranking Criteria - Each proposal is to be scored according to the following criteria. **This calculation will be done in an excel spreadsheet.**

Indicate with a "1" for each that apply. Leave blank for those that don't apply.

1. _____ Project results will reduce the immediacy and/or severity of threats to one or more of Montana's native species.
2. _____ Is it a Species of Concern or a USFWS Threatened or Endangered Species.
3. _____ Conservation needs identified in project currently are not being addressed by any existing programs or other funding sources (excluding SWG funding).
4. _____ Project benefits the public.
5. _____ The project will yield occurrence/distribution data and/or can be used for comprehensive planning efforts.
6. _____ Budget total is appropriate for the scope of the project.
7. _____ Partnerships outside the agency are being used in the project.
8. _____ *Degree to which project results can benefit multiple native species (species assemblages or wildlife communities)*

From the average of the Technical Committee scoring, projects will be prioritized and funding recommendations will be provided to the Steering Committee based on available funding.

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Appendix E

Montana Fish, Wildlife & Parks Staff Exploratory Group

The following FWP Staff participated:

Thomas Baumeister	Conservation Education
Dianne Tipton	Conservation Education
T.O. Smith	CFWCS Coordinator
Andrew Jakes	CFWCS Planning Team
Chris Smith	Directors Office
Marc Scow	Facilitation
Mark Deleray	Fisheries
Mark Sweeney	Fisheries
Ken McDonald	Fisheries
Tom Flowers	Law Enforcement
Pat Flowers	Regional Management
Carolyn Sime	Wildlife
Bill Semmons	Wildlife
Kristi Dubois	Wildlife
Allison Puchniak	Wildlife
Pat Gunderson	Wildlife
Howard Burt	Wildlife

Working Statement 1

“What are some of the strategies, processes and actions that would foster the best possible outcome of broadening FWP’s focus to try and more completely achieve its vision and mission statement?”

Participation

- Develop a strategy that includes FWP employees, commission, legislators and community groups
- Do a public survey to measure the state of the publics knowledge and familiarity with funding and management needs and opinion of what we should be doing
- Must have intra agency participation
- Create partnership with other agencies
- Collaboration with other agencies and within FWP
- We must bring the public along with us as we plan and move our paradigm
- Continue the regional and cross regional discussions
- Involvement of the public early and often

Outreach/Education and Marketing

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- Use focus groups
- Work with Con/Ed to develop a message and delivery method
- Use bottom up approach for internal buy in
- Find ways to sell the program to landowners through positive example
- Tailor outreach messages to specific audiences
- We need to plan to meet MEPA and NEPA (a plan that doesn't require these isn't worth having)
- Meet with traditional hunters and anglers's groups to get their feedback and ideas MWF, TU etc...
- Legislative Outreach
- Prepare a public involvement strategy
- As much public involvement as feasible
- Get buy in through marketing
- Revise the roadmap as needed
- Keep hunters and anglers and legislator informed through web site and email
- Use facilitated meetings to include all biologists and public
- Use lots of education and outreach
- Develop a way to "sell" the program to traditional constituents
- In-Reach and Outreach efforts will be important
- Have outreach for private landowners
- Use internet, radio, TV, papers to get the word out to the public
- Need to let the public know that we are not using license dollars for broadening focus, but need additional funding
- Identify the financial risks and reward and inform the public upfront about those
- Need education to get everyone on the same page
- Prepare a historical account of where we have come from and where we need to go
- Try and eliminate misconceptions from the beginning
- Answer the question why? We need to do this and then tell the public
- Identify the goals and priorities of the plan and then gauge the public to see if theirs are the same
- Develop a statement that is 50 words or less that explains why we need comprehensive management and it makes sense then educate the public
- Provide information to the public about FWP funding really works and why we need additional funding
- Identify the "hook" to get people to buy in
- Seek buy in internally and outside FWP
- Sell the program internally
- Discuss how SWG funds would be allocated internally and upfront
- Use landowner incentives
- Public Outreach

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17258 *Planning*

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- 17260 • Use leadership to keep process moving
- 17261 • Set a modest agenda
- 17262 • Use caution as plan develops
- 17263 • Be flexible during the planning process in order to amend the roadmap as
- 17264 needed
- 17265 • Develop a clear statement with other partners of intent for what the plan
- 17266 will be
- 17267 • Use innovative methods
- 17268 • Develop a planning goal alongside our partners and with FWP employees
- 17269 • Identify alternative funding sources that we can use as match
- 17270 • Write the plan by habitat type not by species
- 17271 • Through [...planning...], identify specific projects at regional level for
- 17272 funding
- 17273 • Use existing plans
- 17274 • Identify knowledge gaps
- 17275 • A plan that is measurable, quantifiable, and has real objectives
- 17276 • A plan that includes the needed resources of funding and staffing to meet
- 17277 objectives
- 17278 • Need to incorporate all the plans we currently have (elk, wolf, prairie dog
- 17279 etc.)
- 17280 • Plan should focus on Federal threatened or endangered species and
- 17281 special concern then expand to include communities and systems not a
- 17282 single species approach
- 17283 • Use habitats as the foundation for all planning
- 17284 • Develop a timeline
- 17285 • Create a statement of Intent
- 17286 • Develop a Roadmap
- 17287 • Find ways to broaden our management protocol to including monitoring of
- 17288 all species
- 17289 • Provide future SWG funding at the regional level
- 17290 • Plan should be the framework for decision making not the decision itself
- 17291 • Plan must provide enough direction to be meaningful but not obligate FWP
- 17292 to focusing future funding on specific things
- 17293 • Identify Goals and objectives for plan within a time frame

17294

17295 ***Working Statement 2***

17296

17297 "What would be the best possible outcomes of broadening FWP's focus to try
17298 and more completely achieve its vision and mission statement?"

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17300 *Constituents or Other Agencies*

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Primary Finding: FWP employees thought that one of the best outcomes could be acceptance by and support from the public, private landowners and other agencies for FWP comprehensive programs

- Hunters and anglers would have a broader ownership commitment
- Engagement of the non-hunting public with FWP that results in their support for our programs
- A truly comprehensive plan for all wildlife that is accepted by the public
- Forges strong partnership with interest groups and public
- All agencies cooperate so that we can manage comprehensively
- Increased support for FWP from diverse constituencies
- Landowners participate in habitat incentives that come from the plan
- Hunter and anglers that realize the benefits that comes from comprehensive management
- A better land ethic where people respect the biological community
- Improved public perception of all FWP programs
- Everyone accepts overall plan
- There are no political ramifications to broadening the focus

Funding and Staff

Primary Finding: Participants were clear in pointing out that increased funding to FWP could be a best possible outcome, but that increased funding must be accompanied by increased staffing.

- Needed funding and staff for (...increased management, monitoring ... of all species
- We have increased long term permanent funding
- Funding and personnel become available for management of all species
- Increased staff
- More staff to accomplish goals
- Have additional funding to manage all species
- SWG is a funded federal mandate
- Increased funding
- Secure funding and FWP spends it responsibly toward conservation of all species
- FWP gains support and ability to protect resources
- We have sufficient funds to implement the plan so it becomes permanent
- More FTE's to accomplish comprehensive management

Management Paradigm

Primary Finding: Participants expressed that a shift in the way FWP and its constituents view wildlife and wildlife management to a more comprehensive approach could be a best possible outcome. **Note:** this outcome indicates that

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there is a perception that FWP and our constituents currently do not view wildlife and wildlife management in a comprehensive enough manner.

- Sportsmen and FWP acceptance of multi species approach
- Constituents shift the way they think from species specific to comprehensive
- Public would accept new way of managing
- Everyone sees the big picture of management
- A greater appreciation of regional ecotypes
- Hunter and anglers that realize the benefits that comes from comprehensive management
- Move our paradigm of management to all species management
- Shift our approach to management and view all fish and wildlife in an integrated way
- Move our paradigm of management to all species management
- FWP would manage for all species regardless of game classification

Multi-Species

Primary Finding: Comments were made that being able to focus on more of Montana's species could be a best outcome of broadening FWP's focus.

- More efficient use of dollars to manage all not just single species
- FWP would have a true ecotype approach
- Integration of all species management
- Game and nongame species benefit
- Increased management, monitoring and management of all species
- Recover all T&E species and stabilize sensitive species
- All outdoor activities are perceived as important
- Better information about species and habitat relationships
- Better comprehensive management of all species
- Fewer listings under ESA

Montana Fish, Wildlife & Parks

Primary Finding: Broadening FWP's focus could lead to achieving its mission.

- Gap between Helena office and the field is bridged
- All FWP's vision and mission statements are met
- FWP advances the conservation agenda
- Fulfill our FWP mission
- Move away from crisis management and species of special concern

Environment or habitat

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Primary finding: Healthier habitats and environment could be a best possible outcome.

- We have healthier natural environment for all species
- Healthy ecotypes across Montana that support Fish and Wildlife that live in all habitats
- (Plan...) creates better habitat resulting in increased hunting opportunities

Working Statement 3

“What are the worst possible outcomes of broadening FWP’s focus to try and more completely achieve its vision and mission statement?”

Constituents

Primary finding: More comments were received concerning constituent relations than any other category. By far the largest concern was that by broadening our focus FWP would lose its traditional hunters and anglers community support

- Outside stakeholder groups might not participate
- We alienate one or more groups of constituents
- We actually cause less support for any of our programs
- We lose traditional support from sportsmen
- Constituent groups become divided
- We promise the public something we can’t deliver
- Public will not understand plan
- Game and nongame constituents are divided
- Alienate our sportsmen
- Lose our traditional constituents
- Alienate our traditional supporters
- If we use habitat approach, we might be accused of taking authority from land managers and private landowners
- Backlash from the public about species of concern
- Private landowners will oppose the agency
- Loss of traditional constituent support
- Drives a wedge between game and non game supporters and managers
- Sportsmen perceive we are moving game dollars to nongame issues

Biology

Primary finding: FWP employees were concerned that moving from an individual species approach to a comprehensive approach could create conflicts in management needs. This problem was somewhat addressed by comments that the plan should focus on quality habitat management for communities

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- 17437 • Potential for ecological conflict between species and between native and
- 17438 non-native would be realized
- 17439 • Plan does not result in biological actions and further degrades support for
- 17440 planning efforts
- 17441 • Plan is not habitat based enough
- 17442 • Conflicting management mandates for different species
- 17443 • Loose our focus on community habitat
- 17444 • Plan will not be habitat based and will continue promoting species
- 17445 management
- 17446 • There is no change in how we manage habitats and species
- 17447 • Data collected will be misused

17448

17449 *Money*

17450

17451 Primary finding: FWP employees were concerned that either permanent funding
17452 would not materialize, or that additional work would be created without the
17453 funding to acquire additional FTE resulting in additional workload

17454

- 17455 • Other states do not participate fully and derail the opportunity for long term
- 17456 permanent funding
- 17457 • Waste time and money
- 17458 • Legislators divert funding
- 17459 • Develop plan in anticipation of funding and it doesn't come
- 17460 • Creates more work with no additional FTE or money
- 17461 • We can't match federal funds and loose funding
- 17462 • Adds more work with no additional FTE or funding
- 17463 • Creates work with no meaningful outcome

17464

17465 *Politics*

17466

17467 Primary finding: FWP employees were concerned that legislators would not
17468 approve of our actions and would create difficulties for FWP

17469

- 17470 • FWP embraces a comprehensive management approach, but the public
- 17471 and legislators do not
- 17472 • SWG becomes an un-funded federal mandate
- 17473 • Legislators attempt to punish us because they do not support it
- 17474 • Our actions create political fallout

17475

17476 *Montana Fish, Wildlife & Parks*

17477

17478 Primary findings: FWP employees were concerned that FWP would be divided
17479 among by management interest or by field versus the staff

17480

- 17481 • Division within FWP

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- 17482 • Department becomes divided
- 17483 • Increases the division between field and HQ
- 17484 • Division within FWP

17485

17486 *General*

17487

17488 Primary finding: FWP employees commented that by further addressing the
17489 needs of all species, recreational opportunities and thus quality of life could
17490 actually be lost while enhancing our wildlife communities

17491

- 17492 • Loss of recreational opportunities
- 17493 • Quality of life is lost

17494

17495 ***Working Statement 4***

17496

17497 Participants were informed that even if SWG became a long term permanent
17498 funding source FWP would need alternative funding sources to fulfill its mission.
17499 They were asked to brainstorm all possible ways that FWP could gather
17500 additional new funds.

17501

- 17502 • .01% sales tax
- 17503 • License plates
- 17504 • Coal bed methane tax
- 17505 • Property tax surcharge
- 17506 • Tax on RV's
- 17507 • Federal land use tax
- 17508 • Soda pop tax like Arkansas
- 17509 • Non-resident entry tax
- 17510 • University cooperation
- 17511 • Lottery
- 17512 • Interest from a one-time investment of hunters and anglers's dollars
- 17513 • Auction Grizzly/Wolf and other unique animal tags
- 17514 • Nongame stamp
- 17515 • Wild trout stamp
- 17516 • Real estate transaction tax
- 17517 • Gambling or other sin tax
- 17518 • NGO donations
- 17519 • Outfitters and guides tax
- 17520 • Private donations
- 17521 • Develop a line of nongame products (maps/etc.) for sale
- 17522 • Old CARA type tax (bird seed etc.)
- 17523 • An endowed foundation
- 17524 • Oil/Gas taxation
- 17525 • Coal tax trust fund
- 17526 • Sell state lands to create an endowment

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- 17527 • Remove SWG and or DJ and PR match requirements
- 17528 • Nongame activities license or stamps (bird watching/mountain biking
- 17529 stamps)
- 17530 • FWP foundation dollars
- 17531 • Solicit contributions through NGO type org.
- 17532 • Canoe and Kayak fees
- 17533 • Off road vehicle tax
- 17534 • Bed tax
- 17535 • Public lands fee
- 17536 • Local options tax
- 17537 • Birdathon and other non-sporting competitions
- 17538 • State highway funds mitigation
- 17539 • Travel Montana
- 17540 • Surcharge on all new construction permits

Federal Requirement #1

17541

17542 “Information on the distribution and abundance of species of wildlife (including

17543 low and declining populations as the State fish and wildlife agency deems

17544 appropriate) that are indicative of the diversity and health of the State’s wildlife”

17545

17546

17547 Participants were asked about what data, resources or methods should be

17548 considered or used to meet this requirement.

17549

17550

- 17551 • Gather info from all databases into one spot
- 17552 • State databases
- 17553 • Use information from NHP species of concern list
- 17554 • Include professional judgment at the regional level in concert with NHP
- 17555 and USFWS list
- 17556 • MFISH database
- 17557 • Game database
- 17558 • Furbearer database (harvest/tracking surveys)
- 17559 • Wildlife collection permits
- 17560 • Migratory bird permits (bird banding lab)
- 17561 • Other agencies and tribal data
- 17562 • (Caution that much of this data will be observational not abundance data
- 17563 that could provide historical trends/ data we have is not population trend
- 17564 data and will ultimately be subjective)
- 17565 • GAP analysis data
- 17566 • Baseline data from conservation easements
- 17567 • Use observations taken during game surveys
- 17568 • Raptor routes
- 17569 • Incidental observations by biologists
- 17570 • Incidental observations by public
- 17571 • Make use of NGO lists of low and declining populations (birds espc.)

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Federal Requirement #2

“Descriptions of locations and relative condition of key habitats and community types essential to conservation of species identified in (1).”

Participants were asked about what data, resources or methods should be considered or used to meet this requirement.

- Agricultural statistics service data could be used to determine % habitat not currently providing habitat
- Use GIS layers and maps of species ID'd in #1, expand those locations and access that total habitat
- Use species richness to determine what habitat types are most essential
- Use GAP type analysis to ID habitat types with greatest richness of species that we determine to be of concern in #1 (this will be dependant on past surveys)
- Look for communities that are still compromised of native species containing a species we ID as of concern in #1 and give priority to that related habitat
- Need to review life history and habitat needs of species we ID in #1
- Intersect Species information with all related habitat layers in a matrix (eg wolf grassland yes, Mountain yes etc....)
- Use current distribution layers of species we ID in #1 overlaid on different scales of habitat
- Develop a list of specialist versus generalists species and use their related habitats to ID those essential for conservation
- Use different habitat scales depending on species range size and number of habitats used
- Have a broad-scale habitat map, then have all less pronounced habitat type within each of the broad categories (1 montane forest/ 2 meadow complex/ montane riparian etc...)
- Rely heavily on professional judgment
- Make sure to relate small-scale habitat types to the public
- Scale will be dependant on species
- *Group concluded to use three scales of habitat type 1) broad habitat types, 2) smaller scale within each habitat type, GAP type fine detail (if necessary for species)

Federal Requirement #3

“Descriptions of problems, which may adversely affect species identified in (1) or their habitats, and priority research and survey efforts needed to identify factors, which may assist in restoration and improved conservation of these species and habitats”

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Participants were asked about what data, resources or methods should be considered or used to meet this requirement.

- Use local biologists expertise
- Use existing management and recovery efforts
- Wholesale damage to habitat
- Describe habitat related problems
- Describe invasive or exotic species
- Describe harvest/poaching/collecting problems
- Identify contaminants issues
- Disease and climate change issues
- Describe the FTE and funding needed to address problems
- Include genetic information about hybridization
- Use GIS to target habitats
- Allow biologists to help identify problems

Federal Requirement #4

“Descriptions of conservation actions determined to be necessary to conserve the identified species and habitats and priorities for implementing such actions”

Participants were asked about what data, resources or methods should be considered or used to meet this requirement.

- Ask local biologists expertise
- Cost share with private groups on purchases of habitat
- Develop a good ownership boundary on habitats we are concerned with
- Pull people together on each specific species to determine
- Prioritize habitats versus critical value that is intact and those that are in jeopardy
- Develop lists of species/groups of species and habitats
- Protect what is left/stop the bleeding/recover the degraded

Federal Requirement #5

“Proposed plans for monitoring species identified in (1) and their habitats, for monitoring the effectiveness of the conservation actions proposed in (4), and for adapting these conservation actions to respond appropriately to new information or changing conditions”

Participants were asked about what data, resources or methods should be considered or used to meet this requirement.

- Continue ongoing monitoring efforts
- Identify monitoring gaps

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- 17663 • Question if we are monitoring the right things
- 17664 • Look at assemblages of species
- 17665 • Don't duplicate efforts of other agencies
- 17666 • Do more habitat and vegetation monitoring
- 17667 • Use aerial photography
- 17668 • We need to develop new monitoring methods for species not being
- 17669 monitored
- 17670 • FTE's will be a huge issue determining if this is even feasible
- 17671 • Assess current monitoring plans that aren't being implemented
- 17672 • Include monitoring protocols for groups of target species
- 17673 • Peer review should be used
- 17674 • Set a follow up for monitoring to determine if it is having effect
- 17675 • ID desired outcomes and monitor to see if they are met
- 17676 • Set a number of places and species to survey and measure over the long
- 17677 term
- 17678 • Get commitment of staff to actually do it
- 17679 • Plan must be flexible to change monitoring plan if it isn't meeting
- 17680 objectives
- 17681 • Use adaptive management
- 17682 • Define trigger points (at what point do you start doing something)

Federal Requirement #6

"Descriptions of procedures to review the Plan-Strategy at intervals not to exceed ten years"

Participants were asked about what data, resources or methods should be considered or used to meet this requirement.

- Revise actions and priorities every five years
- Compare accomplishments with objectives annually
- Internal committee review of progress
- Special projects bureau Chief conducts review
- Provide summary of annual accomplishments to public
- Newsletter
- How much \$ spent annually and on what
- ID key interest groups and methods to communicate progress

Federal Requirement #7

"Plans for coordinating, to the extent feasible, the development, implementation, review, and revision of the Plan-Strategy with Federal, State, and local agencies and Indian Tribes that manage significant land and water areas within the State or administer programs that significantly affect the conservation of identified species and habitat plans for coordinating, to the extent feasible, the

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development, implementation, review, and revision of the Plan-Strategy with Federal, State, and local agencies and Indian Tribes that manage significant land and water areas within the State or administer programs that significantly affect the conservation of identified species and habitats”

Participants were asked about what data, resources or methods should be considered or used to meet this requirement.

- Create working groups oriented towards species /habitats
- Have management attendance at technical meetings and have them report back to administrative level meeting group and vice versa
- Establish oversight committee for each region (multi-agency) at the administrative level
- Base the technical committee on habitats
- Make sure to invite all experts in habitat or species from each region
- Private landowners should be considered at the oversight level
- Use MOU to finalize the coordination between agencies
- Coordinate monitoring with other agencies
- Make sure other agencies know what we are responsible for and have sideboards
- Use an email list to communicate a newsletter

Appendix F

Law Enforcement Exploratory Group

The following staff participated.

Jim Kropp	Chief of Law Enforcement
T.O. Smith	CFWCS Coordinator
Mark Anderson	Warden Sergeant
Tom Flowers	Warden
John Lesofski	Warden
Jim Conner	Warden

Law Enforcement Officers were asked what activities they currently perform that benefit conservation of the species and habitats identified through the Strategy as in greatest need.

Survey/Inventory/Monitoring

- Furbearer and game animal tagging
- Predator tagging
- Investigation of illegal kills
- Road kills

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- 17753 • Wolf sightings, kills and enforcement
- 17754 • Public request for identification of nongame species
- 17755 • Falcon/Hawk (falconer enforcement)
- 17756 • Incidental encounters with species during checks/stations etc.
- 17757 • CWD and west Nile monitoring
- 17758 • Transfer of DNA samples

17759

17760 ***Species Specific Involvement (including Con/Ed, survey, disease issues,***
17761 ***re-introduction and management and enforcement activities)***

17762

- 17763 • Waterfowl
- 17764 • West Slope Cutthroat
- 17765 • Bull Trout
- 17766 • Sauger
- 17767 • Native Lake Trout
- 17768 • Paddlefish
- 17769 • Sage-grouse
- 17770 • Pallid Sturgeon
- 17771 • Grizzly Bear
- 17772 • Wolf
- 17773 • Lynx
- 17774 • Bald Eagle
- 17775 • Prairie Dog
- 17776 • Bison
- 17777 • Numerous Nongame
- 17778 • Loons
- 17779 • Bobcats
- 17780 • Swans
- 17781 • Pelicans
- 17782 • Harlequin Ducks
- 17783 • Great Blue Herrons
- 17784 • Black Footed Ferret

17785

17786 ***Habitat***

17787

- 17788 • Snowmobile and ATV Issues with Habitat
- 17789 • Animal Feeding (bears, deer, turkey pheasant)
- 17790 • No-Wake Zone enforcement
- 17791 • Fish Ponds
- 17792 • Exotic Introductions
- 17793 • Human/Bear and Wolf Habitat Conflicts
- 17794 • Aquatic Habitat Restoration for West Slope Cutthroat
- 17795 • Public Point of Contact for Most Current FWP Habitat Programs
- 17796 • Fire Season Restriction Enforcement in Critical and all Habitat

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- 17797 • 310 Violations/Motorhomes/Fuel Storage
- 17798 • Enforcement of Habitat Easements
- 17799 • Drought Restriction Enforcement for Aquatic Habitat
- 17800 • Weed Issues/Weed Free Hay
- 17801 • Focus already existing Con/Ed activities to better meet SWG priorities

17802

17803 ***Ideas For the Future***

17804

- 17805 • Fund current FTE for Survey/Inventory work on SWG Tier Species
- 17806 • Additional Funding could be used for saturation patrols to focus staff support here needed on SWG projects
- 17807
- 17808 • Integrate current patrols and habitat assessments (example whitebark pine, water conditions in critical areas. Wardens cover large amounts of habitat)
- 17809
- 17810
- 17811 • Determine which wardens in the state have a greater proportions of their duties that are SWG related and consider funding and match benefits to agency.
- 17812
- 17813
- 17814 • Increase overtime to allow for flexibility to support more SWG activities
- 17815 • Serve on SWG Committees so Enforcement can collaborate with future projects from the beginning
- 17816
- 17817 • Seek compensation from SWG projects for work performed
- 17818 • Emphasize the importance of Law Enforcement being included in future SWG legislative appropriation language
- 17819

17820

17821 **Appendix G**

17822

17823 **Invitees to Advisory Group Meeting October 1, 2003**

17824

Agency or Organization	Contact	Title	Address	City	Zip
BLM	Roxanne Falise	Wildlife Biologist	P.O. Box 36800	Billings	59107
USFS	Cindy Swanson	Director, Watershed Wildlife, Fisheries and Rare Plants	Federal Building, P.O. Box 7669	Missoula	59807
USFWS	Lori Nordstrom	Biologist	100 N. Park Suite 320	Helena	59601
USFWS	Mark Wilson				
NHP	Sue Crispin	Director	Montana State Library	Helena	59620

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Montana and Wyoming Tribal Fish and Wildlife Commission	Gayle Skunk Cap	Vice Chairman	Blackfeet Nation	Browning	59417
NRCS	Dave White	State Conservationist	10 East Babcock Street Room 443	Bozeman	59715
DNRC	Tom Schultz	Administrator	1625 11th Avenue	Helena	59620
DNRC	Pete Van Sickle	Forest Management Bureau Chief	2705 Spurgeon Road	Missoula	59804
MSU	Dr. Scott Creel	Department of Ecology	310 Lewis Hall	Bozeman	59717
UM	Dr. Dan Pletcher	Director, Wildlife Biology	School of Forestry	Missoula	59812
Turner Endangered Species Fund	Mike Phillips	Executive Director	1123 Research Drive	Bozeman	59718
The Nature Conservancy	Jamie Williams	State Director	32 S. Ewing, Suite 215	Helena	59601
The National Wildlife Federation	Tom France	Director	240 N. Higgins Suite 2	Missoula	59802
Trout Unlimited	Bruce Farling	Executive Director	PO Box 7186	Missoula	59807
Montana Wildlife Federation	Craig Sharpe	Executive Director	PO Box 1175	Helena	59624
Walleye Unlimited	Bob Gilbert	Executive Director	PO Box 1228	Sidney	59270
Montana Stock Growers	Steve Pilcher	Executive Vice President	420 North California	Helena	59601
Montana Association of Counties	Harold Blattie	Assistant Director	2715 Skyway Drive	Helena	59620
Montana Petroleum Association	Gail Abercrombie	Executive Director	601 Euclid Avenue	Helena	59624

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Montana Wood Products Association	Ellen Engsted	Executive Vice President	PO Box 1149	Helena	59624
MT State Gov.	Honorable Walter McNutt	Chairman EQC	110 12th Avenue	Sidney	59270
MT State Gov.	Todd O'Hair	Natural Resources Policy Advisor	Montana State Capitol	Helena	59620
MT State Gov.	Todd Everts	Legislative Analyst	PO Box 201704	Helena	59620
Rocky Mountain Elk Foundation	J. Dart	President	2291 West Broadway	Missoula	59807
Montana Farm Bureau	John Youngberg	Vice President of Gov. Affairs	502 South 19th Avenue Suite 104	Bozeman	59718
Western Environmental Trade Association	Don Allen	Executive Director	33 S. Last Chance Gulch Room 211, AJM Johnson Hall, Montana State University	Helena	59601
USGS	Dick Jackowski	Center Director		Bozeman	59717
Private Land Owner	Barbara Cowen			Havre	59501
Defenders of Wildlife	Minette Johnson		114 West Pine Street	Missoula	59802
Boone and Crockett Club	George Bettas	Executive Officer	250 Station Drive	Missoula	59801

Questions and Input of Participants of October 1, 2003 Advisory Group

Attendance

Montana State University	Scott Creel
Montana Natural Heritage Program	Sue Crispin
Stockgrowers Association	Steve Pilcher
WETA	Don Allen
Walleyes Unlimited	Mike Sedlock
Farm Bureau	Greg Heil
Boone and Crockett	John Youngberg
USGS	George Bettas
	Dick Jackowski

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17839	University Of Montana	Dick Hutto
17840	DNRC	Gary Frank
17841		Tom Schultz
17842		Pete Vansickle
17843	The Nature Conservancy	Brian Martin
17844	BLM	Katie Baltrusch
17845	USFS	Skip Kawolski
17846	NRCS	Pete Husby
17847	MACO	Ellen Allestad
17848	For Barbara Cowan	Scott Wink
17849	National Wildlife Federation	Tom France

17850

17851 ***Questions for Discussion***

17852

- 17853 • What role does your agency or organization want to play in the
- 17854 development of the Comprehensive Fish and Wildlife Plan?
- 17855
- 17856 • Is there a representative from your organization other than you who
- 17857 should be the contact for becoming involved with planning or receiving
- 17858 information about planning activities? *(Please provide contact information,*
- 17859 *if possible)*
- 17860
- 17861 • Are there any other agencies and organizations you think should be
- 17862 involved in the planning process?

17863

17864 ***Participant Input***

17865

17866 Collaboration with agencies, organizations and the public

17867

17868 May be difficult to get enough conservationists in some parts of the state (e.g.

17869 north central and eastern portions).

17870

17871 It would help the NPS to be informed of where they fit and be a part of

17872 collaborative efforts, instead of only looking inward – as an island.

17873 Involve Indian Tribes.

17874

17875 Involve more people with economic interest, e.g. outfitters and guides.

17876

17877 Make efforts to be sure large private landowners, especially ranchers and

17878 farmers, feel included and have opportunities to be involved.

17879

17880 Farmers and ranchers feed 75% of Montana's wildlife and therefore will want

17881 input into the plan.

17882

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We need to include private landowners in the process. The recommendations coming out of the plan could have implications for them. We need to have meetings in small eastern communities to be sure we get their input.

Most of the land use impacts are not going to come from agriculture but from other groups.

Most of wildlife issues will be land use/growth related. Consequently we need to incorporate land use planning efforts.

Groups that should be included in the process include real estate, oil and gas, city/county planning and others involved in land use planning issues.

Should think about how this fit into the growth policy debate and development that is going on statewide.

Need to get legislators involved.

We need to be able to develop trust in us and in the process if it is going to succeed.

Information and Education

Can involve more people if organizations are used as an information conduit. The Farm Bureau could get the word out via its newsletter, which goes out to all 11,000 members.

Needs to be taken (by FWP) out to the people. Open houses/listening sessions are best and will result in participation by more people including those who do not want to speak in front of large groups.

We are experiencing dramatic changes in user groups (e.g., growing interest in birds and birding) and we need to be thinking how to tie this in with traditional hunting and fishing. We have an upcoming segment of the population with no connection with hunting and fishing but they are interested in wildlife. In addition, as ethnicity changes, we should look at them see how user trends are changing which could put us in a position to better address the needs of Montanans. We need to be looking at nature trails as well as shooting ranges and giving maps to floaters, etc.

Need to be sensitive to landowners feeling things may be shoved down their throats, and expensive (e.g. if species get listed)

Place more emphasis on why the SWG plan must be done (especially if we want to engage landowners or others not as familiar with this process)

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There are wildlife recreation/tourism/economic diversification aspects to Montana's wildlife that should be incorporated. Look at how we're capitalizing on Lewis and Clark.

Conduct a series of open house like we did with wolf plan. In the first round of open houses have a dog and pony show to explain what we are doing, benefits etc. Treat these as a kind of scoping session. When we have a draft plan completed, go back out to those same places to present the draft and get local input.

There are a lot of organizations with newsletters and other publications that would be willing to print information on the plan and process if we provide it to them, for example, in a press release format. Some of these include: Stockgrowers, Farm Bureau, Grain growers.

Produce maps showing land ownership and species present so landowners could see the distribution and better understand the implications for them.

Many people will feel that frogs and snakes are not important and that we are wasting our time and theirs. We need to overcome this mindset somehow.

Use phone inquiries, advertise in newspapers, or other means; don't just have meetings as a means to make participation easier for more people

Once the plan is completed and the information is available to the public there will be great expectations of the agency. People will expect us to do something about the issues we identify. Need to address their expectation in the plan. Especially the question of what we will do if we don't get any more SWG funding.

There was some concern expressed that FWS approval of the plan somehow constitutes an expansion of FWS authority. Due to negativity toward ESA by landowners, this could be a difficult problem to overcome.

The whole deal comes down to the public trusting FWP and what we will do with the data.

Planning

No participants desired to be actively involved in the technical aspects of the plan but preferred to be informed of progress and have future opportunities to support planning efforts and review drafts.

The Strength of the plan in setting up monitoring programs.

Advantages of organizing the plan by 3 or 4 regions of the state are it is easier for people to participate and take advantage of information from existing plans;

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17975 disadvantage is combining them into one plan, and ensuring statewide view and
17976 interest from groups with statewide not regional perspective.
17977
17978 USGS has a heritage of data collection from the time of the 1885 Biological
17979 Survey to mapping by Merriam. Those functions live on within USGS today. The
17980 plan could help us prioritize/plan research that will have the strength of a
17981 partnership with the state. It would also help USGS align our priorities with state
17982 priorities.
17983
17984 FWP should make a concerted effort to spend time with NRCS staff, learn about
17985 their programs, see what NCRS spends money on and how; identify
17986 opportunities and build synergies, avoid duplications; 5-10 year funding is
17987 available from Farm Bill programs gets spent
17988
17989 SWG plan needs to compliment the work the National Wildlife Federation and
17990 others are doing, and not duplicate efforts of other agencies; SWG plan will be a
17991 failure if we don't accomplish this
17992
17993 Be sure to keep the process open
17994
17995 We should consider including incentives for private landowners in the plan.
17996
17997 We need to think about how will habitat be addressed and how we can develop a
17998 comprehensive plan for animals when the habitat is owned by others?
17999
18000 The shorter and tighter the planning process the better (get it done in a matter of
18001 months, not years like Canyon Ferry; bull trout was endless and unrewarding,
18002 grizzly planning had good facilitation)
18003
18004 FWP is already oriented toward a successful model in garnering public comment,
18005 the difficulty will be in defining "comprehensive" and setting priorities and from
18006 groups/individuals focused on specific conservation issues and feeling like their
18007 focus is not garnering the prioritization that it deserves.
18008
18009 The plan is an opportunity to establish comprehensive surveys – including
18010 coordinated statewide surveys and inventories. To get information more quickly,
18011 there could be a coordinated statewide survey every year to address a particular
18012 issue.
18013
18014 DNRC would find the comp plan helpful in layout and design of our forest
18015 management activities. And it would establish communication links between
18016 DNRC and FWP biologists. It would help reduce conflicts and help us with our
18017 conservation plans.
18018
18019 It might be difficult to please everyone.
18020

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We have a varied knowledge base where we know a lot about one species and not much about another and how that will impact the prioritization process.

There is a planning conflict with managing species that live in the same areas but have different habitat needs. E.g. mountain plover and sage-grouse both living in eastern MT with one liking grazed over lands and the other preferring 'old growth' sagebrush.

Need to assess whether we've "restored" something and determine how will that be done even for more localized efforts like the Milltown Dam project.

The explicit differences between species are important to recognize up front.

Organize review groups taxonomically rather than geographically; or by method or approach (by type of data needed for all groups – first determine species, the associated habitat, then associated threats).

Perhaps a quid pro quo approach would be helpful. We are asking landowners and others for their help with this process. In exchange, perhaps we can provide some help with other wildlife issues.

FWP should make tentative decisions on things like lists of species, habitat types (e.g. say here's what we think is an endangered habitat and what species are viable); then have an advisory committee test the reality.

The plan is a great opportunity to join with partners.

The plan should stay away from using this money for habitat acquisition. We should tell the public right up front that the funding would not be used for that purpose.

Limit the scope of the plan either geographically or by species. It might be too big.

Limit the range of activities that we would undertake as part of the plan and make this clear to the public. For example, if we are going to seek additional regulatory authority to implement the plan the public should know that-if we aren't they should know that as well.

Given the number of species, the plan has to focus on habitat

Plan should be adaptive and flexible including flexibility in scale meaning that one can "zoom in" if you need to, or remain "zoomed out" the rest of the time.

Plan should be used for setting priorities and address suites of species.

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The plan should be geographically based because MT is diverse in terms of habitat and people (local areas have different customs, etc.)

The planning process is a good opportunity to learn more about our fish and wildlife resources and prioritize conservation needs.

We need to look at dimensions of the plan: 1) figure out what is out there; 2) gather presence/absence info; 3) monitor trend; 4) identify what is driving trends; 5) adaptive management; 6) work from the level of individuals to populations then communities the to ecotypes.

Another, more rapid way for the plan to take us where we need to go would be to: 1) find out what is out there; 2) identify habitat relationships (including land uses) – which provides insight into issues for the species, and then 3) move directly into adaptive management including incentives. (The model for this approach is the land bird-monitoring program at University of Montana)

During planning sit down with leadership and get them on board then identify potentially affected parties and who will be most impacted. Then solicit their involvement and determine where you are going to concentrate efforts. Develop creative solutions to get consent and focus on collaboration.

Look at PIF Plan. All bird – good process-habitat driven-coarse scale; also look at PPJV and BBS plans.

Must be careful of getting into a popularity contest rather than prioritizing based on biological resource; good planning effort that she has been involved with is the “YES” committee- structure is blend of science and agency working group. GB Management Plan; different groups but concepts blended together.

Look at systems and how to manage and conserve them.

Geographic means of organizing the plan would include “ecotypes,” “biomes,” and/or “hot spots.”

To be successful, the FWS needs to give up some control to landowners. Landowners have management objectives for their lands and the plan has to be compatible with those landowner goals in meeting species needs. Most landowners want to support critters out there to some degree. FWP needs to be seen as a partner instead of an enforcer.

Plan needs to have the full range of tools including public education.

Plan needs to take into consideration what FWP has authority for and what it doesn't. It needs to recognize parties who do have the authority to take actions (that FWP does not have authority to take).

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FWP should develop the strategy (plan for the plan) then later, organizations can decide how much involvement they want, at what points

Utilize existing plans and fit them into the SWG plan (e.g. prairie dog, or sage-grouse/sage-steppe); don't reinvent them and use indicator species where possible

Funding options, and implementing existing plans should be integral to the SWG plan because people will be more energetic about how they can influence spending of money from various sources, not just be involved in a planning effort.

Match and Alternative Funding

Identify focus areas and use FWP programs like Habitat Montana as match

The Boone and Crockett Club is interested in funding for good research and in partnering with FWP in any areas that would lend themselves to Conservation Education and working with teachers and schools.

University will be able to help describe low and declining populations and threats; already a strong emphasis at MSU on T and E, species assemblages and landscape projects; nationwide trend with conservation planning; universities just part of that trend. Providing match beyond deferring overhead is difficult because most is federal dollars.

The plan needs to consider if SWG money dries up, how much game money will FWP have to support the new efforts.

Align project priorities with various sources of funds; integrate opportunities from all applicable (federal and state) funding sources available to FWP (e.g. SWG, LIP, Section 6 competitive funds are some of the federal opportunities) as well as other agencies.

Groups like Walleyes Unlimited have grant programs and may be able to help with matching funds.

DNRC has T&E species as well as species of special concern on their lands. If we are match limited they could provide match and use the SWG funds. DNRC is working on a Habitat Conservation Plan for T and E species and other species for a total of 30 (wolverine, woodpecker, goshawk, westslope cutthroat) on their forested land; developing strategies to conserve species and identify data gaps.

There could be value of SWG plan in filling in data gaps; suggested that if the plan identified species that were of concern to DNRC they could possibly match SWG funds for survey, inventory and research. DNRC is a major landowner in

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the state; CFWP plan could fit into DNRC plan depending on project suitability. Their plan will be very prescriptive in solutions; tiered down to activities that are being conducted on the ground but will not just be metrics but also ID information needs.

General

Emphasis on wildlife in addition to elk, rainbow trout (e.g. sauger, eastern Montana surveys) is good.

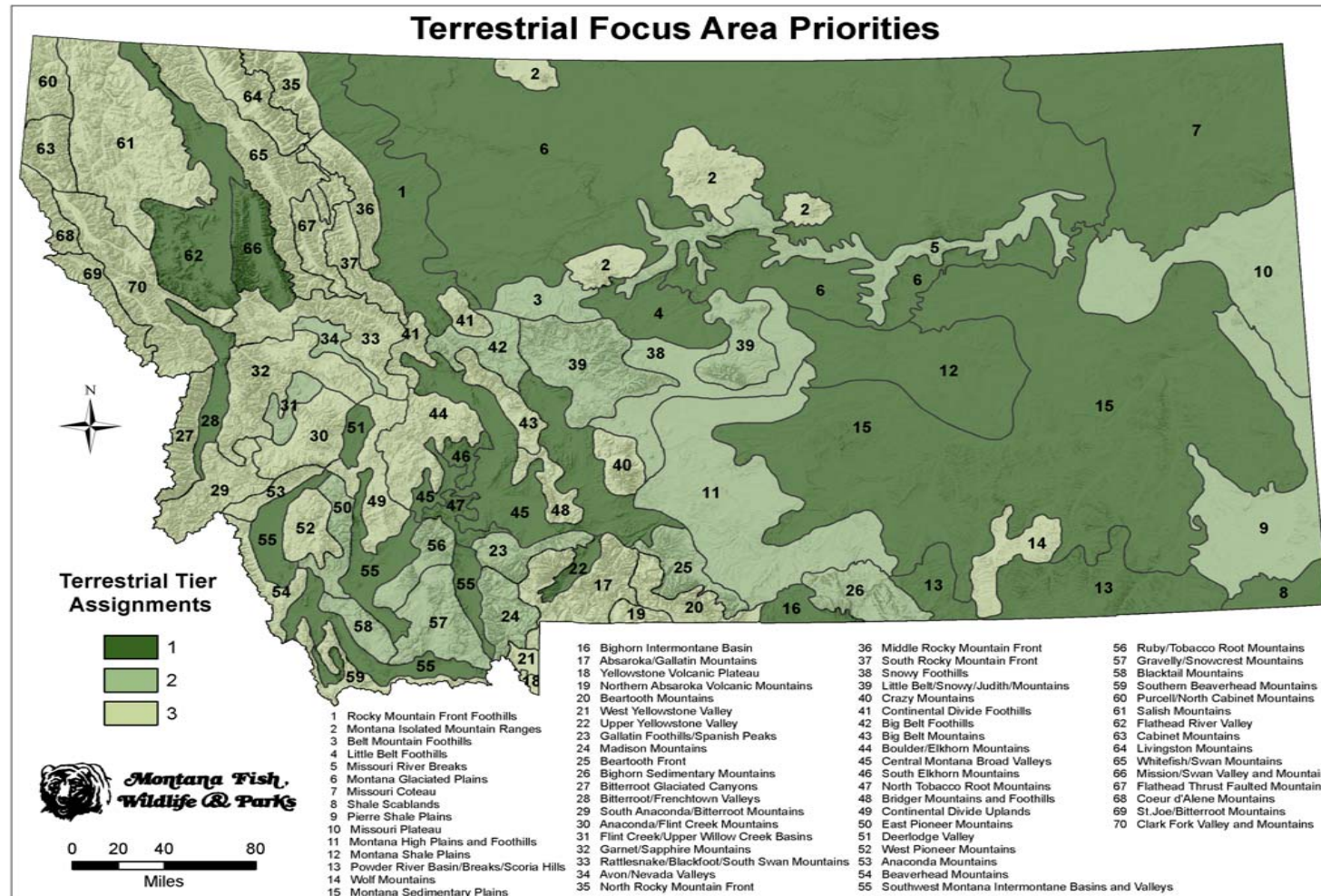
Congress and others are tired of train wrecks with T&E listings; being able to avoid listings to begin with would be helpful.

Comment was made that the expectation is that FWP will do more of what we are doing now (efforts like collection of sage-grouse information and cutthroat trout restoration) which will help MT get ahead of the curve.

This plan would help federal land management agencies deal with land management issues in concert with surrounding lands (in context with those lands and on an ecological basis with them). DNRC could use some of the SWG money to do things like the HCP they are preparing for state lands and a culvert survey they are doing.

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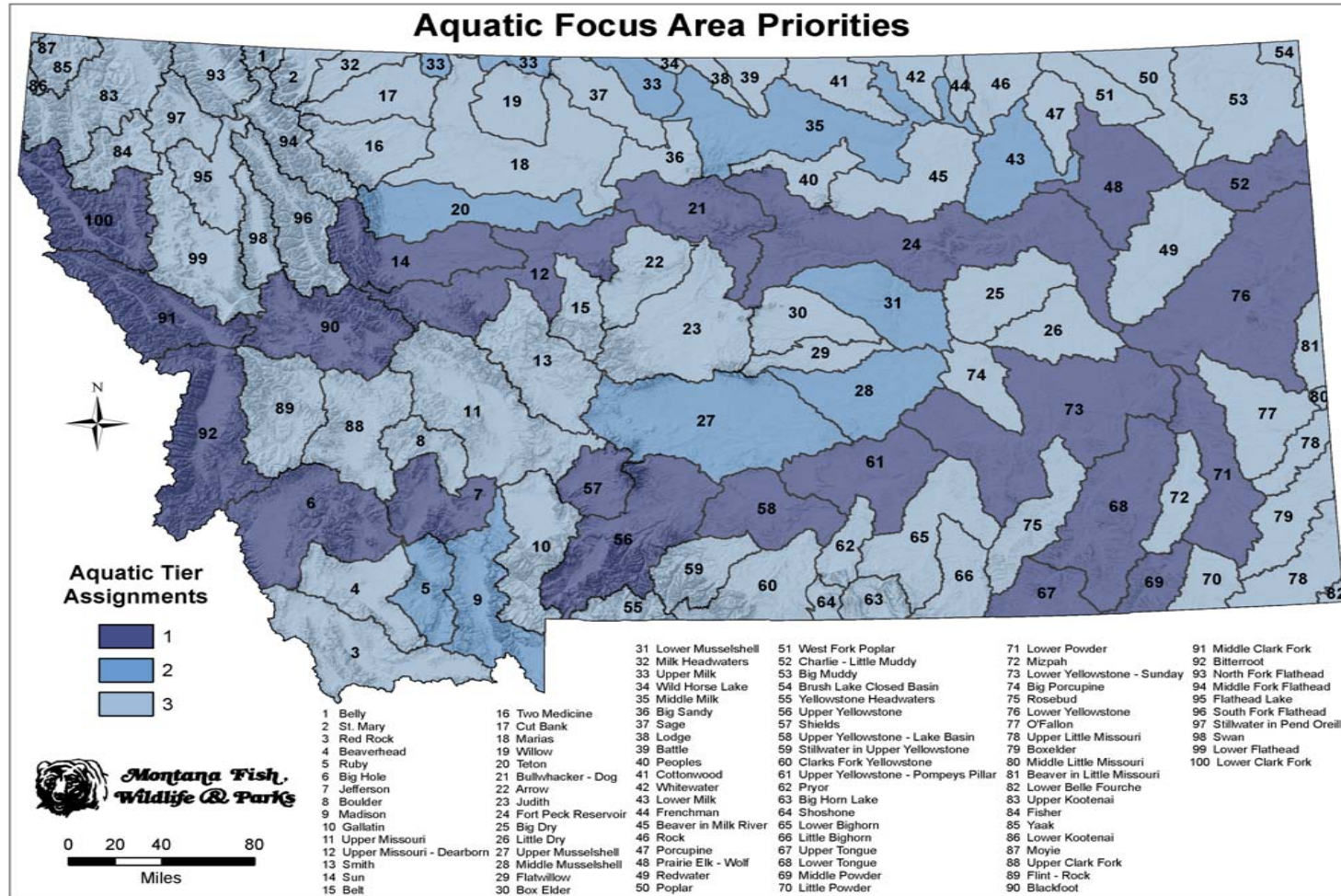
18204 Appendix H: Terrestrial Focus Area Priorities
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18207 Appendix I: Aquatic Focus Area Priorities
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Glossary

Tier: Three levels of Conservation need assigned to focus areas, community types, species, and Inventory Needs. (a fourth Tier was used for just the species component that identifies non-native or peripheral species)

Ecotype: Geographic reference to broad-scale areas of Montana that have similar landscape, geoclimatic and vegetation characteristics.

Essentially Associated: An association between geographic area, vegetation, or fish and wildlife species that is critical to the existence of a population of fish or wildlife.

Focus Area: A terrestrial or aquatic area based on geographic features or the drainage of water that are used to frame locations where comprehensive conservation will occur.

Community Type: A group of associated plants, animals and the related geoclimatic characteristics.

Greatest Conservation Need: Focus Areas, Community Types and Species that are low or declining, federally listed species as either “threatened” or “endangered” or individual/groups of species that lack distribution and occurrence information to assess their status or trends

Comprehensive Conservation: A term used to describe how fish and wildlife and their related habitats are interconnected and how conservation concerns common to all of these can be addressed on a broad-scale giving equal importance to all components.

Conservation Concern: Description of the critical threats that have, are or could adversely affect the populations of fish and wildlife and their related habitats.

Conservation Strategies: Strategic guidance that address conservation concerns.

Ustic: A soil moisture regime that occurs with a limited amount of water available for plants but occurs at times when the soil temperature is optimum for plant growth.

Mesic: Shrubs, grasslands or combination of both that are adapted to a moderately moist habitat

Xeric: Shrubs, grasslands or combination of both that are adapted to an extremely dry habitat